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Madame Nathalie Barbeau Helitoweart Inc. 860, Marie-Victorin St-Nicholas, Lévis (Québec) G7A 3S9





Trois-Rivières, le 18 octobre 2011

Madame Nathalie Barbeau Helitowcart Inc. 860, Marie-Victorin St-Nicholas, Lévis (Québec) G7A 3S9

Objet: TCCA STC SH06-24 Issue #3

Chère Nathalie,

Vous trouverez ci-joint le certificat original SH06-24, Révision #3, qui inclus le modèle EC130-B4.

Vous avez donc en votre possession tous les documents relatifs à cette révision. À l'exception du document AAC-CPL-BP-AS350/355/EC130-1000.

Ce document demeure la propriété de Aviatech. Une copie de ce document est disponible pour consultation par TCCA

En espérant le tout conforme, veuillez agréer Madame Barbeau, nos salutations distinguées.

Mirko Zgelø

Président



Ste Web: www.ats-ast.com

Aircraft Certification - NAI 700, Leigh Capreol Street Dorval (Québec) H4Y 1G7

July 7, 2011

Notre référence - Our file NAI 5012-06-0092

Mr. Mirko Zgela 4100, Renoir Trois-Rivières, Québec G8Y 6Y6

SUBJECT:

Transmittal of Supplemental Type Certificate (STC) No.: SH06-24

Issue No.:

Approval Date: August 17, 2006

Issue Date:

July 7, 2011

Mr. Zgela,

The subject Supplemental Type Certificate (STC) document is issued in response to your application dated February 17, 2011 for the Installation of Helitowcart BearPaw.

Please ensure to inform the holder of this certificate that he should comply with all requirements stated in CAR part V, subpart 21, Division VIII - Responsibilities of a Design Approval Document Holder.

Parts manufacturing that may be covered under this certificate are either regulated under CAR Part V, Subpart 61 or under CAR part V subpart 71, § 571.06(4).

Yours truly,

Jean-Pierre Francoeur

Senior Engineer

Aircraft Certification

For Minister of Transport

Encl.

*C*anadä



## Department of Transport

# Supplemental Type Certificate

This approval is issued to:

Number: SH06-24

Helitowcart Inc.

Issue No.:

860 Marie-Victorin

Approval Date:

August 17, 2006

St-Nicholas, Lévis, Québec

Issue Date: July 7, 2011

Canada G7A 3S9

Responsible Office:

Ouébec

Aircraft/Engine Type or Model:

See Continuation Sheet Page 2 of 2

Canadian Type Certificate or Equivalent:

See Continuation Sheet Page 2 of 2

Description of Type Design Change:

Installation of Helitowcart BearPaw

Installation/Operating Data. Required Equipment and Limitations:

For the Robinson Models R44 and R44 II Helicopters:

Installation of Helitowcart Bear Paw BP44 is to be performed in accordance with TC approved Helitowcart Inc. Master Document List, Report: HTC-MDL-BP-R44-1000, Revision C dated April 15, 2010, or later Transport Canada approved revision.

The BearPaw must be installed in accordance with Helitowcart Inc. Installation Instructions Document: "HTC-314-0011-00-D, BearPaw Model BP44, Installation Instructions - R44".

See Continuation Sheet Page 2 of 2



Conditions: This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated will not adversely affect the airworthiness of the modified product.

For Minister of Transport

Canadä

#### (Continuation Sheet)

Number: SH06-24 Issue 3

# NOTE: THIS ADDENDUM SHALL REMAIN PART OF THE CERTIFICATE REFERRED TO THEREIN.

# Installation/Operating Data, Required Equipment and Limitations (Cont'd):

# For the Eurocopter (formerly Aerospatiale) AS350 and AS355 Series Helicopters:

Installation of Helitowcart Bear Paw BP350 is to be performed in accordance with TC approved Helitowcart Inc. Master Document List, Report: HTC-MDL-BP-AS350/355-1000, Revision F dated April 8, 2010, or later Transport Canada approved revision.

The BearPaw must be installed in accordance with Helitowcart Inc. Installation Instructions Document: "HTC-314-0020-00-E, BearPaw Model BP350, Installation Instructions – AS350/355".

## For the Eurocopter EC 130 Helicopters:

Installation of Helitowcart Bear Paw BP130 is to be performed in accordance with TC approved Helitowcart Inc. Master Document List, Report: HTC-MDL-BP-EC130-1000, Revision A dated May 13, 2011, or later Transport Canada approved revision.

The BearPaw must be installed in accordance with Helitowcart Inc. Installation Instructions Document: "HTC-314-0031-00-A, BearPaw Model BP130, Installation Instructions – EC 130".

Fleet Eligibility List				
Make	Model	Type Certificate Data Sheet		
Robinson	R44	H-97		
Robinson	R44 II	H-97		
Eurocopter	AS 350 B	H-83		
Eurocopter	AS 350 B1	H-83		
Eurocopter	AS 350 B2	H-83		
Eurocopter	AS 350 B3	H-83		
Eurocopter	AS 350 BA	H-83		
Eurocopter	AS 350 D	H-83		
Eurocepter	EC 130 B4	H-83		
Eurocopter	AS 355 E	H-87		
Eurocopter	AS 355 F	H-87		
Eurocopter	AS 355 F1	H-87		
Eurocopter	AS 355 F2	H-87		
Eurocopter	AS 355 N	H-87		

-End-



Department of Transport daees DMR-BP44

# Supplemental Type Certificate

This approval is issued to:

Helitowcart Inc.

860 Marie-Victorin

St-Nicholas, Lévis, Québec

Canada G7A 3S9

Number: SH06-24

Issue No.:

Approval Date:

August 17, 2006

Issue Date:

July 7, 2011

Responsible Office:

Ouébec

Aircraft/Engine Type or Model:

See Continuation Sheet Page 2 of 2

Canadian Type Certificate or Equivalent:

See Continuation Sheet Page 2 of 2

Description of Type Design Change:

Installation of Helitowcart BearPaw

Installation/Operating Data,

Required Equipment and Limitations:

#### For the Robinson Models R44 and R44 II Helicopters:

Installation of Helitowcart Bear Paw BP44 is to be performed in accordance with TC approved Helitowcart Inc. Master Document List, Report: HTC-MDL-BP-R44-1000, Revision C dated April 15, 2010, or later Transport Canada approved revision.

The BearPaw must be installed in accordance with Helitowcart Inc. Installation Instructions Document: "HTC-314-0011-00-D, BearPaw Model BP44, Installation Instructions - R44".

See Continuation Sheet Page 2 of 2



Conditions: This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated will not adversely affect the airworthiness of the modified product.

> Jean-Pierre Francoeur For Minister of Transport

#### (Continuation Sheet)

Number: SH06-24 Issue 3

#### NOTE: THIS ADDENDUM SHALL REMAIN PART OF THE CERTIFICATE REFERRED TO THEREIN.

#### Installation/Operating Data, Required Equipment and Limitations (Cont'd):

#### For the Eurocopter (formerly Aerospatiale) AS350 and AS355 Series Helicopters:

Installation of Helitowcart Bear Paw BP350 is to be performed in accordance with TC approved Helitowcart Inc. Master Document List, Report: HTC-MDL-BP-AS350/355-1000, Revision F dated April 8, 2010, or later Transport Canada approved revision.

The BearPaw must be installed in accordance with Helitowcart Inc. Installation Instructions Document: "HTC-314-0020-00-E, BearPaw Model BP350, Installation Instructions – AS350/355".

#### For the Eurocopter EC 130 Helicopters:

Installation of Helitowcart Bear Paw BP130 is to be performed in accordance with TC approved Helitowcart Inc. Master Document List, Report: HTC-MDL-BP-EC130-1000, Revision A dated May 13, 2011, or later Transport Canada approved revision.

The BearPaw must be installed in accordance with Helitowcart Inc. Installation Instructions Document: "HTC-314-0031-00-A, BearPaw Model BP130, Installation Instructions – EC 130".

	Fleet Eligibility List				
Make	Model	Type Certificate Data Sheet			
Robinson	R44	H-97			
Robinson	R44 II	H-97			
Eurocopter	AS 350 B	H-83			
Eurocopter	AS 350 B1	H-83			
Eurocopter	AS 350 B2	H-83			
Eurocopter	AS 350 B3	H-83			
Eurocopter	AS 350 BA	H-83			
Eurocopter	AS 350 D	H-83			
Eurocopter	EC 130 B4	H-83			
Eurocopter	AS 355 E	H-87			
Eurocopter	AS 355 F	H-87			
Eurocopter	AS 355 F1	H-87			
Eurocopter	AS 355 F2	H-87			
Eurocopter	AS 355 N	H-87			



# Master Document List Helitowcart

# Eurocopter Model EC 130 B4 Helicopters Installation of BearPaw Model BP130

Report: HTC-MDL-BP-EC130-1000 (Rev A)

APPROVED BY: DATE: MAI 13, 2011
Mirko Zgela

Design Approval Representative DAR #310

Page 1/4



Revision	Revision Date	Revision of Entry	Entered by
Α	May 13, 2011	Initial issue	N/A



#### 1.0 MASTER DOCUMENTS

Document #	Title	Revision Status	Approval by	Date
AAC-CPL-BP- AS350/355/EC130-1000	Compliance Plan – Eurocopter Model AS350/355/EC130 Series Helicopters – Installation of BearPaw Model BP350 and BP130	В	DAR 310	May 11, 2011
ATS-1034-FTP-1000	EC130 B4 BearPaw Installation - Flight Test Plan	NC	DAR 310	Apr 14, 2011
ATS-1034-FTR-1000	EC130 B4 BearPaw Installation - Flight Test Report	NC	DAR 310	May 04, 2011
ATS-1034-STR-1000	Structural Substantiation – Helitowcart BearPaw Model BP130	NC	DAR 310	May 04, 2011
HTC-314-0031-00	BearPaw Model BP130 – Installation Instructions - EC130 B4 Helicopters	NC	DAR 310	May 04, 2011

## 2.0 MASTER DRAWINGS

Drawings #	Title	Revision Status	Approval by	Date
VNR084	BearPaw – Iceblade	R01	DAR 310	Apr 24, 2006
VNR085	BearPaw – Iceblade Threaded Rod	R01	DAR 310	Apr 24, 2006
314-0005-15 (VNR086)	BearPaw – Iceblade Assembly	A (R01)	DAR 310	Apr 24, 2006
314-0007-15 (VNR089)	Bearpaw – Slotted Clip Support	B (R04)	DAR 310	July 31, 2006
314-0015-01	Filler Block 3/32"	Α	DAR 310	Aug 8, 2006
112-0005-00	BearPaw BP130 – Assembly	Α	DAR 310	May 04, 2011
314-0024-01	BearPaw - BP130 Pad	Α	DAR 310	May 04, 2011
314-0025-15	BP130 - L Shaped Clip	Α	DAR 310	May 04, 2011
314-0026-15	BP130 - U Shaped Clip	Α	DAR 310	May 04, 2011



## 3.0 REFERENCE DOCUMENTS

Document #	Title	Revision Status	Approval by	Date
314-0009-01-A	Ultra High Molecular Weight Polyethylene  – Typical Properties	Α	N/A	May 24, 2006
314-0008-01-A	Material Properties - UHMW TIVAR	Α	N/A	May 24, 2006
314-0017-05-A	Heat Shrink Specifications	Α	N/A	Sept 6, 2006



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#### INTRODUCTION

#### Scope

This installation instruction describes the step-by-step approach to install and to perform maintenance of the Helitowcart BearPaw Model BP 130 (P/N 112-0005-00) for the EC130-B4 helicopters.

#### General

The Helitowcart BearPaw is made of machined UHMW TIVAR® polymer sheet. This material combines high-impact performance, low friction and good resistance to chemical. Its high durability will provide superior performance when installed on your helicopter. Any question regarding the Helitowcart BearPaw system shall be directed to Helitowcart Customer Support as indicated in Table (1):

Table 1 - Helitowcart Customer Support

Care of	Mailing Address	Phone, Fax & Email:
Customer Support	877A Alphonse-Desrochers	Tel:1 (418) 561-4512
Helitowcart BearPaw	St-Nicholas, Levis, Quebec,	Fax:1 (418) 836-4575
Helitowcart (Vanair inc)	Canada, G7A 3K6	info@helitowcart.com

#### **Helicopter Effectivity**

This installation instruction applies to the following helicopter models:

Table 2 – Helicopter Model Effectivity

Make	Model	Transport Canada Type Certificate Data Sheet
Eurocopter	EC 130 B4	H-83

#### Installer Responsibilities

The installer shall ensure that the installation of the Helitowcart BearPaw does not conflict with any other part of the helicopter configuration. Technicians performing this installation should be familiar with A/C work and should have been familiarized with the different Helitowcart BearPaw system components prior to performing a first time installation. All steps in this procedure must be followed. Deviations from the procedures may result in potential structural failure or equipment malfunction and will result in a non-compliant installation.

#### **INSTALLATION**

#### **BearPaw Installation**

Reference Documentation:

[1] Helicopter Maintenance Manual EC130 as applicable.



# 314-0031-00-A BearPaw Model BP130 Installation Instructions – EC130

#### Step 1: Helicopter Preparation

- Ensure the helicopter is safe for maintenance;
- Lift the helicopter using the manufacturer recommended practice provided in Ref [1] as applicable to your helicopter model to allow a ground clearance of the skid in the area of the aft cross tube of approximately 1 ½" (38mm);
- Remove Aft AN5 bolt:

**Note:** The BearPaw Model BP130 (P/N 112-0005-00) can be installed with or without the skid tube wear shoes.

#### Step 2: IceBlade Installation

**Note:** The BearPaw Model BP130 (P/N 112-0005-00) can be installed with or without the IceBlades

- With IceBlade Option
- Install ice blades (Qty: 4) (Iceblades P/N 314-0005-15) under BearPaw pad as per drawing (112-0005-00) provided at Annex A.
- Secure ice blades with washer (Washer P/N 263-0001-17) and nut (P/N 262-0001-17).

#### Step 3: BearPaw Installation

- Position the BearPaw under the skid as shown in Figure 1 with narrow edge pointing forward.
- Insert washers (P/N 263-0001-17) through all six bolts: 6x(261-0001-17);
- Insert bolts (P/N 261-0001-17) and washer (Washer P/N 263-0001-17) through BearPaw pad as per drawing (112-0005-00) provided at Annex A:
- Insert filler blocks (P/N314-0015-01) in the six bolts as per drawing (112-0002-00) provided at Annex A;

**Note:** The use of filler blocks (P/N314-0015-01) may be replaced or complemented by the use of washers (P/N 263-0001-17) to fill in the gap. Bolts (P/N 261-0001-17) may be replaced by longer or shorter AN4 bolts as required.

- Insert both U-shaped clips (P/N 314-0026-15) through forward bolts: 4x(261-0001-17);
- Insert both L-shaped clips (P/N 314-0025-15) through aftward bolts; 2x(261-0001-17);
- Insert slotted clip supports (P/N 314-0007-15) through all six bolts. Position slotted clip supports with rounded edge toward helicopter skid;
- Insert washer (P/N 263-0001-17) & screw nuts (P/N 262-0001-17) for a tight fit. Max. torque on nuts 60 in.-lb:
- Re-install removed AN-5 Bolt from step one;
- Remove helicopter from lift;
- Amend Weight & Balance records as required using data provided in Table 3.



Figure 1 - BearPaw Model BP130 (P/N 112-0005-00) - Alignment on Skid





#### **BearPaw Removal**

Step 1: Helicopter Preparation

- Ensure the helicopter is safe for maintenance;
- Lift the helicopter using the manufacturer recommended practice provided in Ref [1] to allow a clearance of the skid in the area of the aft cross tube of approximately 1 ½" (38mm);

#### Step 2: BearPaw Removal

- Remove aftward AN5 bolt;
- Remove nuts (P/N 262-0001-17), slotted clip support (P/N 314-0007-15) on U-shaped clips (P/N 314-0026-15)2x and L-shaped clips (P/N 314-0025-15);
- Remove washers (P/N 263-0001-17), U-shaped clips (P/N 314-0019-15), L-shaped clips (P/N 314-0025-15), filler blocks (P/N314-0015-01) and remove BearPaw pad (P/N 314-0024-01);
- Inspect skid tubes to confirm serviceability;
- Re-install aftward AN5 bolt;
- If the skid tube shoes have been removed, re-install shoes as per reference [1];
- Complete installation by putting helicopter back to normal position by removing lift status;
- Amend Weight & Balance records as required using data provided in Table 3.

#### Weight & Balance

The following information should be used to amend the helicopter weight and balance information following the installation or removal:

Table 3 - Weight & Balance Data

Item	Weight La		eral	Longitudinal	
item			Moment	Arm	Moment
Helitowcart BearPaw Model BP130 (P/N 112-0005-00)	20.0 Lb 9.1 Kg	N/A	N/A	182.2 in. 462.9 cm	3644.0 in-lb 42.12 m-kg

Note: Weight and moment provided are for full kit installation.

#### **Parts Lists**

The Helitowcart BearPaw detailed parts list is as follow:

Table 4 - Parts List

Description	Qty	Part No.	Drawing no./name
BearPaw Model BP130	1	112-0005-00	BearPaw BP130 Assembly
BearPaw Pad	1	314-0024-01	BearPaw BP130 – Pad
U Shaped Clips	2	314-0026-15	BearPaw BP130 - U Shaped Clips
L Shaped Clips	2	314-0025-15	BearPaw BP130 - L Shaped Clips
Slotted Clip Support	6	314-0007-15	BearPaw - Slotted Clip Support
Filler blocks 3/32"	6	314-0015-01	BearPaw – Filler block 3/32"
Bolts	6	261-0001-17	Bolt- AN4-14
Nuts	6	262-0001-17	Nut- MS20365-428

Washers	12	263-0001-17	Washer - AN960-416
Shrink	3	314-0021-01	BearPaw – Shrink Specifications & Install.(1"x6.25")
IceBlade Option Model OIB	4	314-0005-15	VNR086 / IceBlade Assembly
Nuts	8	262-0001-17	Nut- MS20365-428
Washers	8	263-0001-17	Washer - AN960-416

#### INSPECTION

#### Life Limited Items

Three are no life limited items for the Helitowcart BearPaw.

#### **Pre-Flight**

Before each flight the following items should be inspected:

- Check that attachment bolts are installed and secured.
- Check that BearPaws are free from visible damage,
- If damage is found, verify allowable damage according to: Table 5 – Tolerances for cracks & wear and Annex B – BearPaw BP130 Allowable Damage Drawing

#### **Periodic Inspection Schedule**

- The Helitowcart BearPaw shall be inspected every 500 flying hours or yearly whichever comes first.
- The Helitowcart BearPaw can be inspected concurrently with the helicopter landing gear inspection.
- Recommended tolerance for performance of inspection is +/- 10% of the 500 hours period.
- Following an inspection, subsequent interval shall be adjusted to meet the original schedule from time
  of inspection. If inspection is performed earlier than the 10% tolerance, then following inspections
  shall be scheduled not to exceed the above mentioned tolerance.

#### 500 Hour or Yearly Inspection Details

- Remove Helitowcart BearPaw: See Section "BearPaw Removal",
- Inspect all parts for damage & wear. See table & figure below for allowable damage.
- Replace all damaged parts,
- Replace parts worn beyond the tolerances indicated below.
- See Tolerances for cracks & wear:
   Table 5 Tolerances for cracks & wear. &

Table 5 – Tolerances for cracks & wear, &

Annex B - BearPaw BP130 Allowable Damage Drawing

#### Table 5 - Tolerances for Cracks & Wear

Zone	Nominal Dimension (Inches)	Allowable Damage/Wear (Inches)	Cracks
Α	0,50	0,050	
В	1,000	0,250	
С	0,625	0,075	Stiffeners: NO cracks allow in the radius.
D	0,50	0,050	



# 314-0031-00-A BearPaw Model BP130 Installation Instructions – EC130

Е	0,05 (FWD) 0.625 (AFT)	0,050 0,075	Holes: NO cracks around the holes.
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## **Overhaul Requirements**

Not applicable for the designated application of this device.

#### **REVISIONS & APPROVAL**

#### **Revisions**

Date	Rev	Nature of Revisions
May 04,2006	Α	Initial issue

#### **Approval**

Internal Approval :		
Helitowcart inc.		Date:
	Lucien Barbeau, President	
External Approval:	120	
Transport Canada	Nex Zyelat	Date:
	Mirko Zgela, DAR #310	May 4,2011





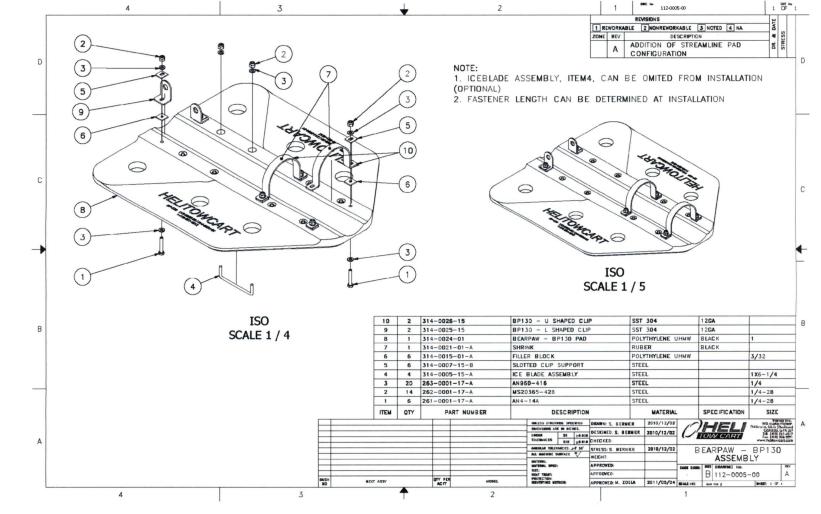
#### Annex A

BearPaw Assembly, Drawing no. (112-0005-00)



# BearPaw Model BP130 Installation Instructions – EC130

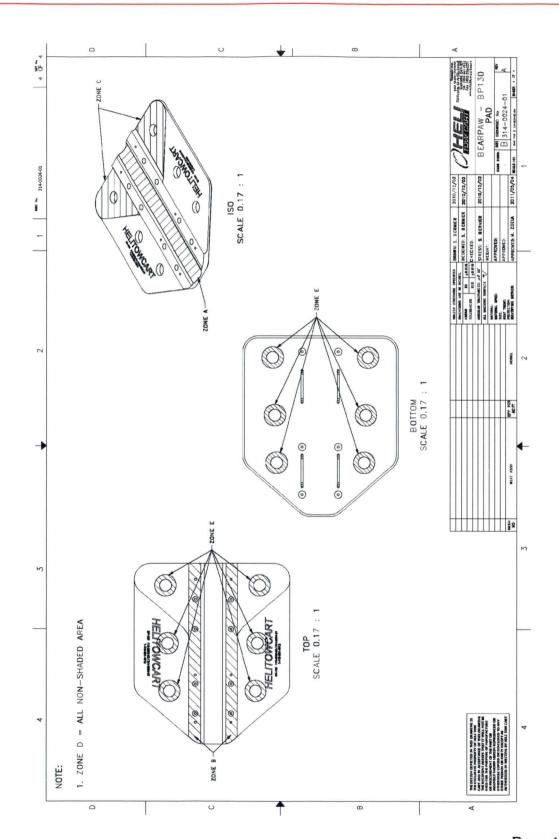
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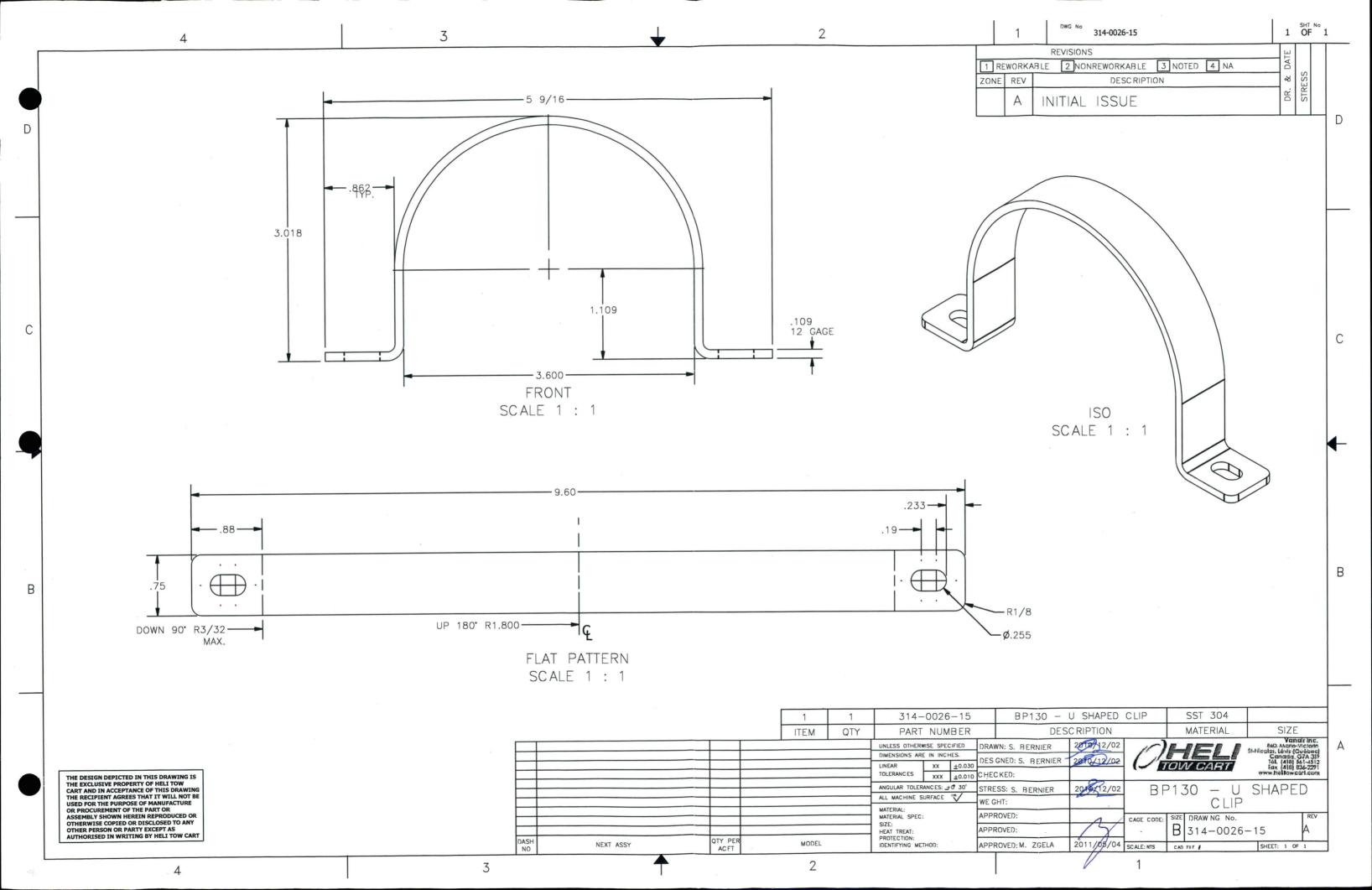


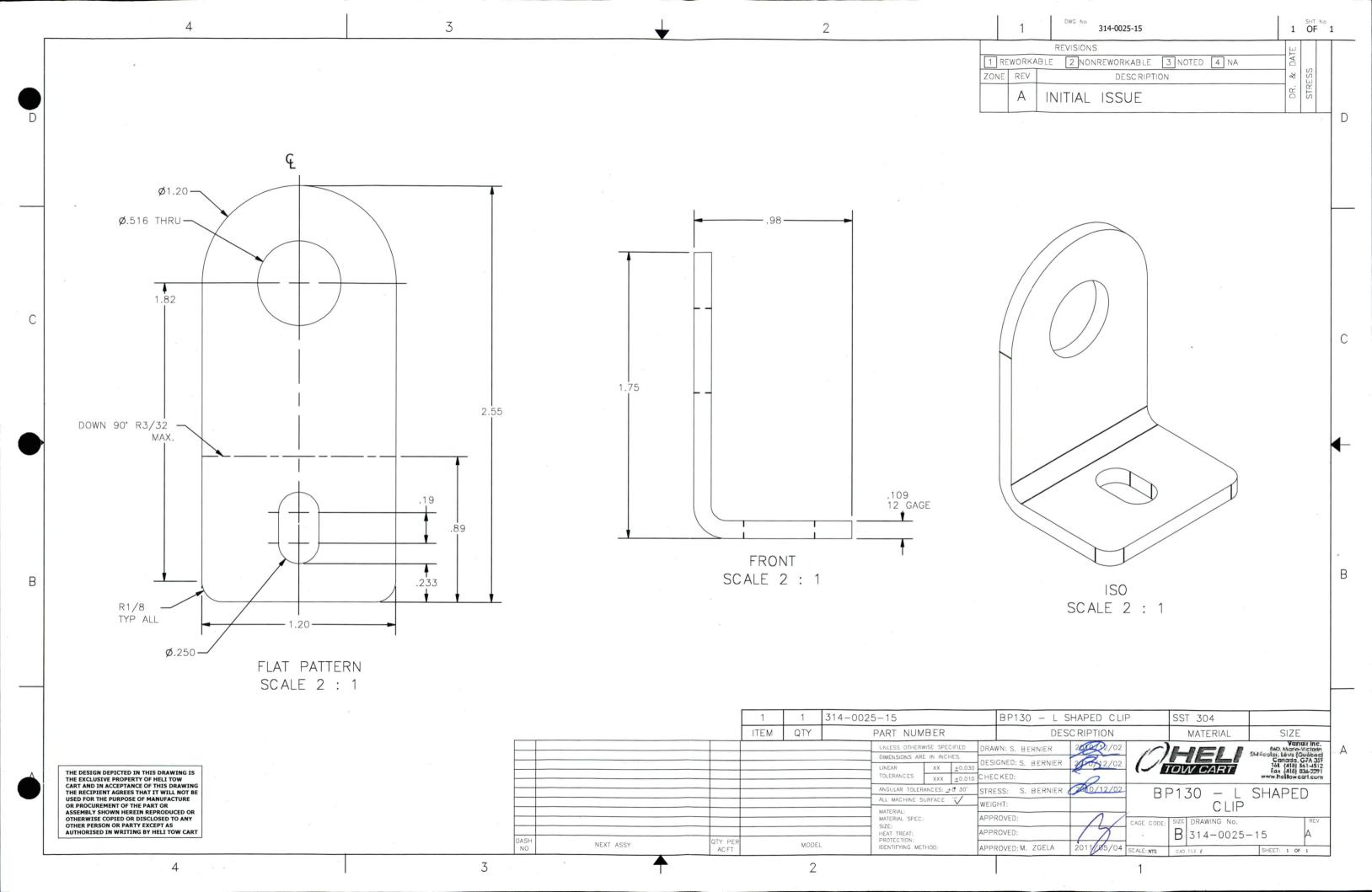
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BearPaw Pad, Drawing no. 314-0024-01 Page 4 of 4.

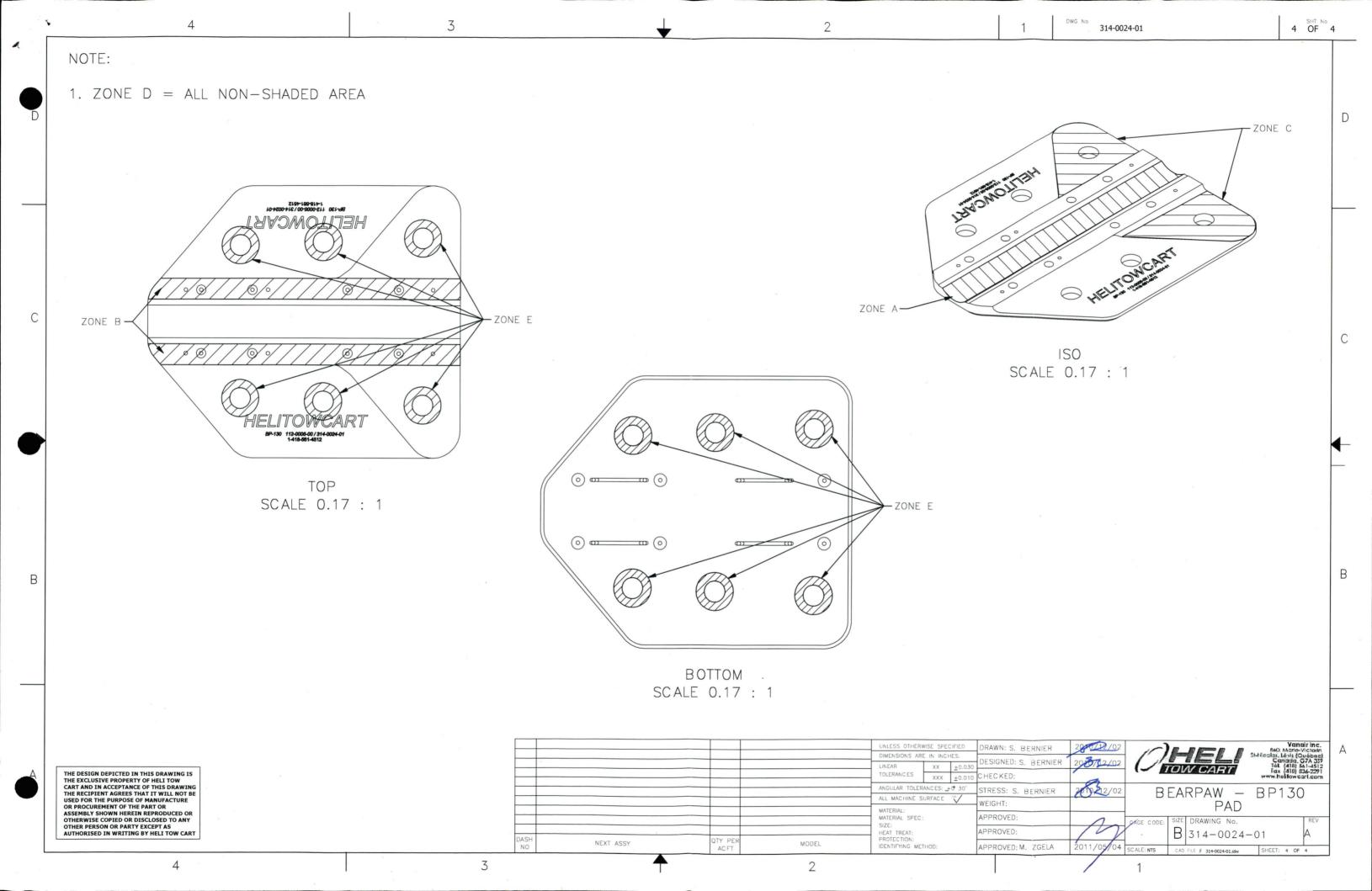


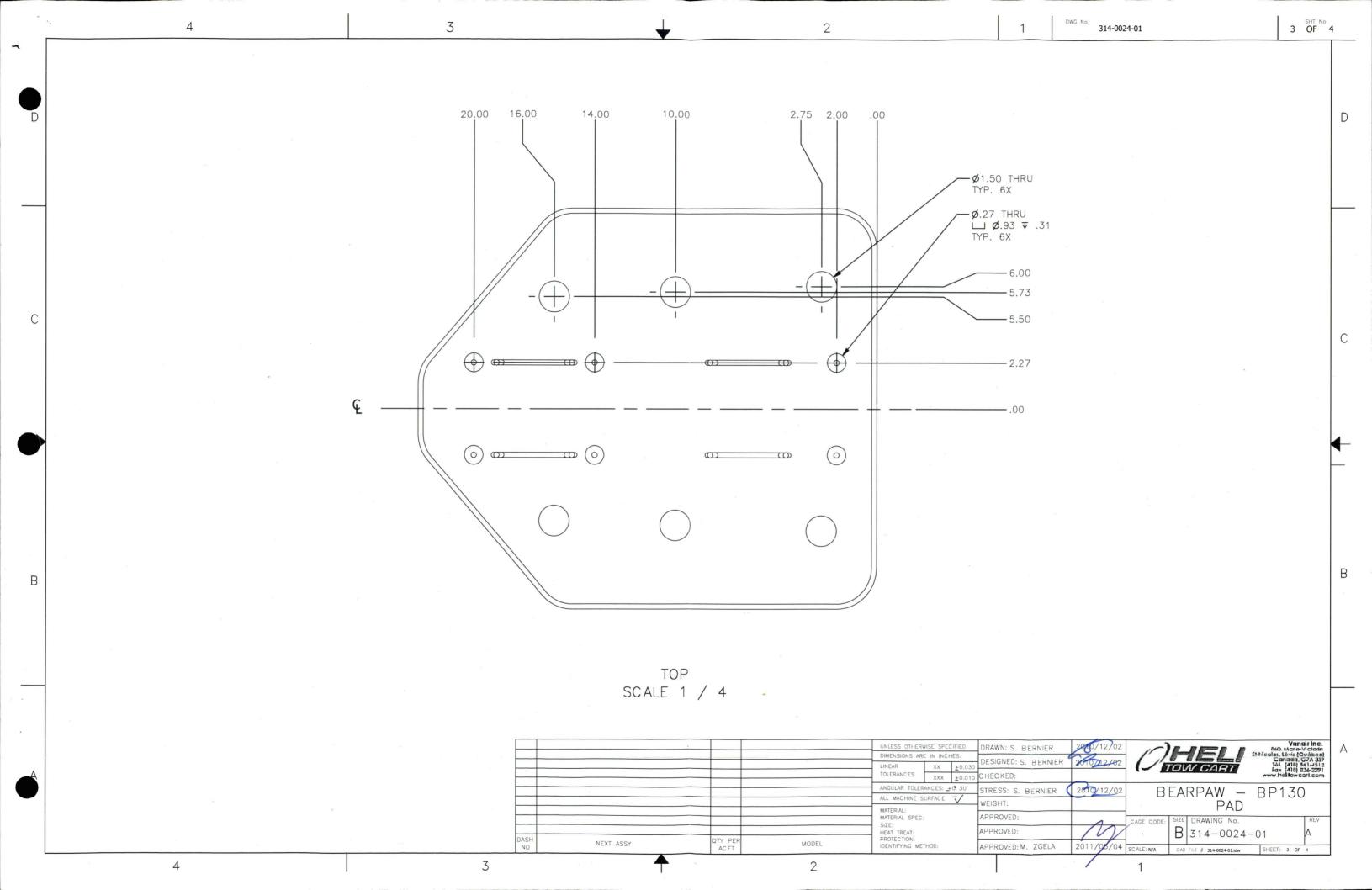


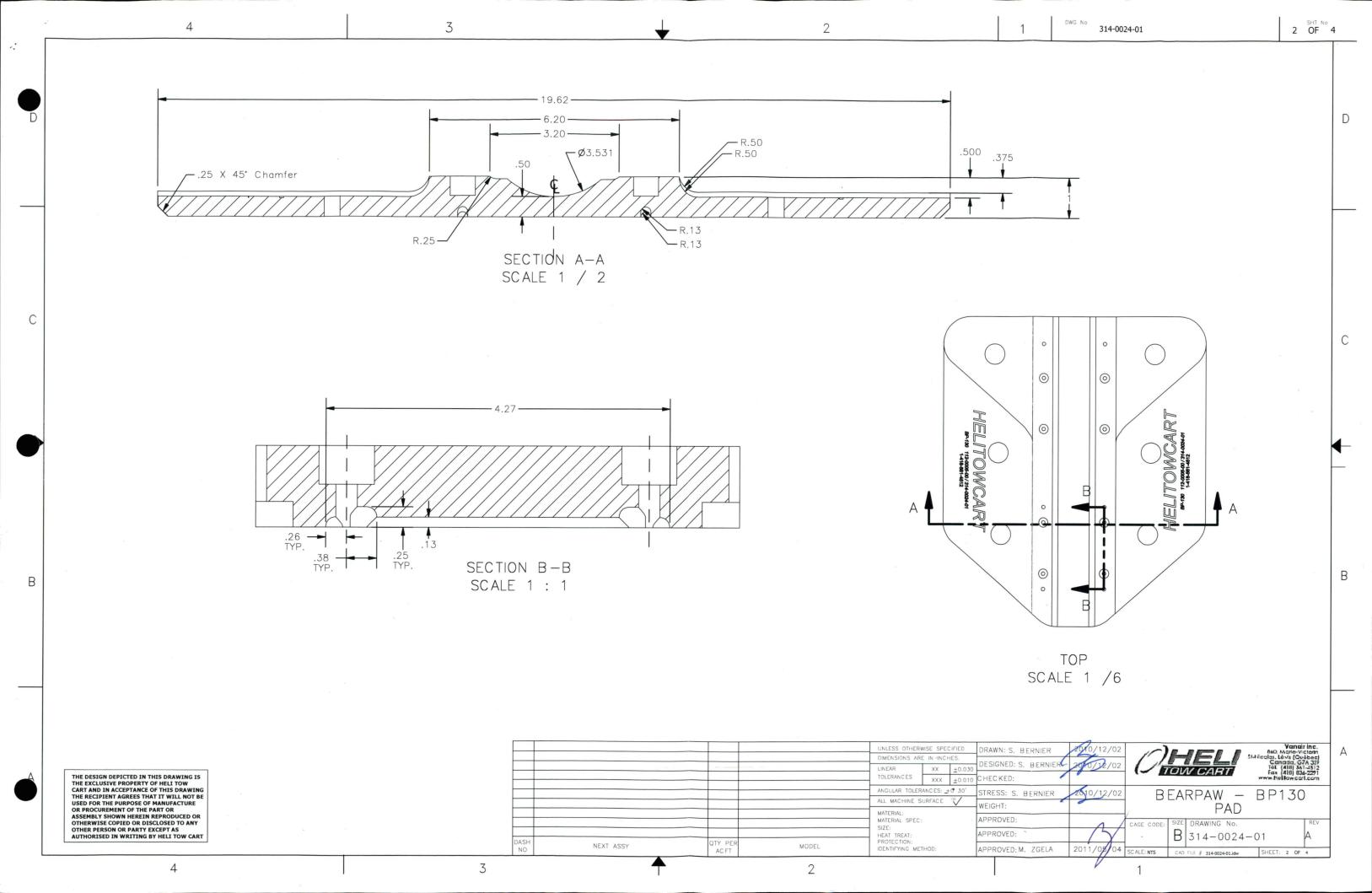
Page 11 of 11

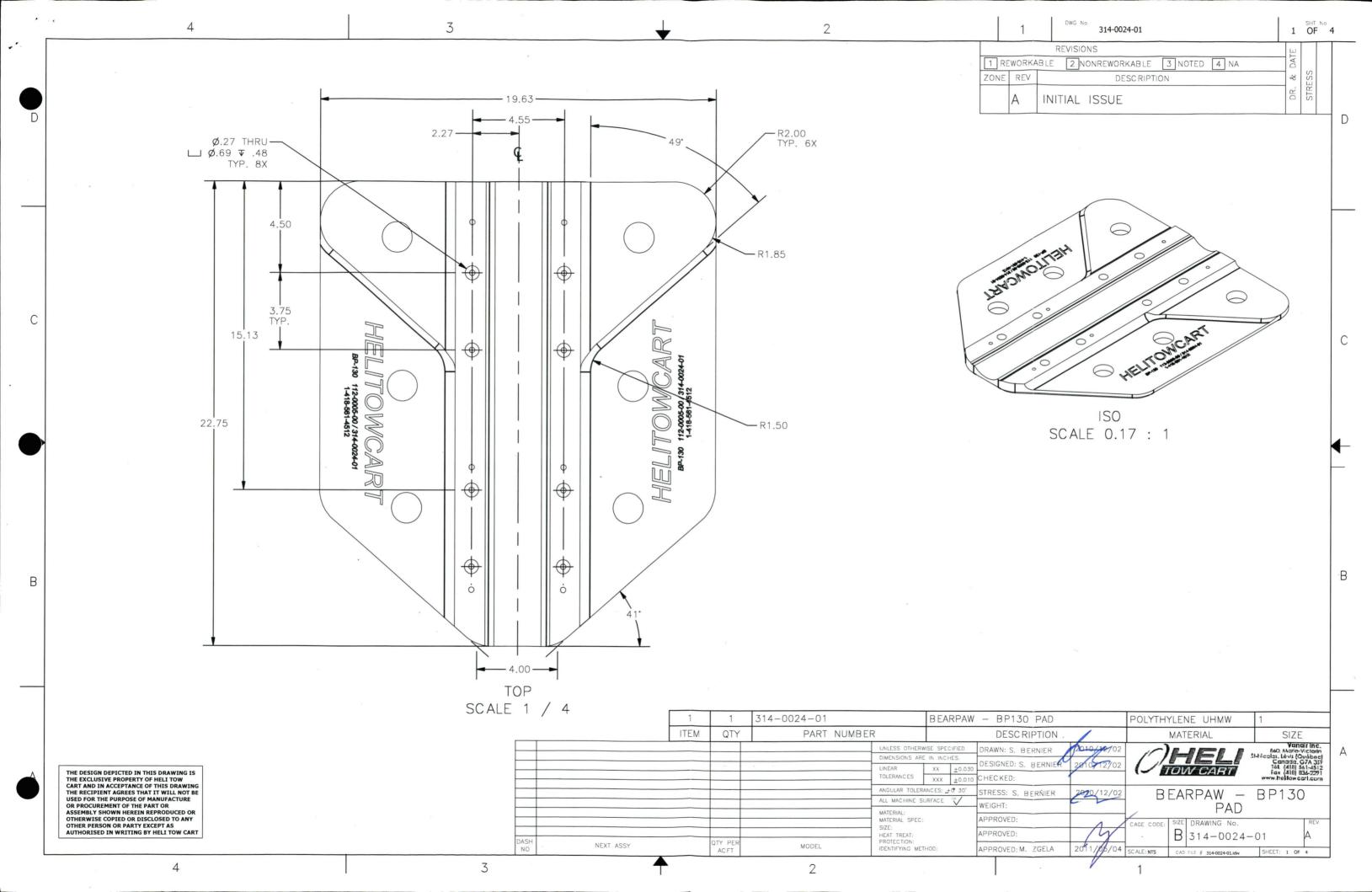


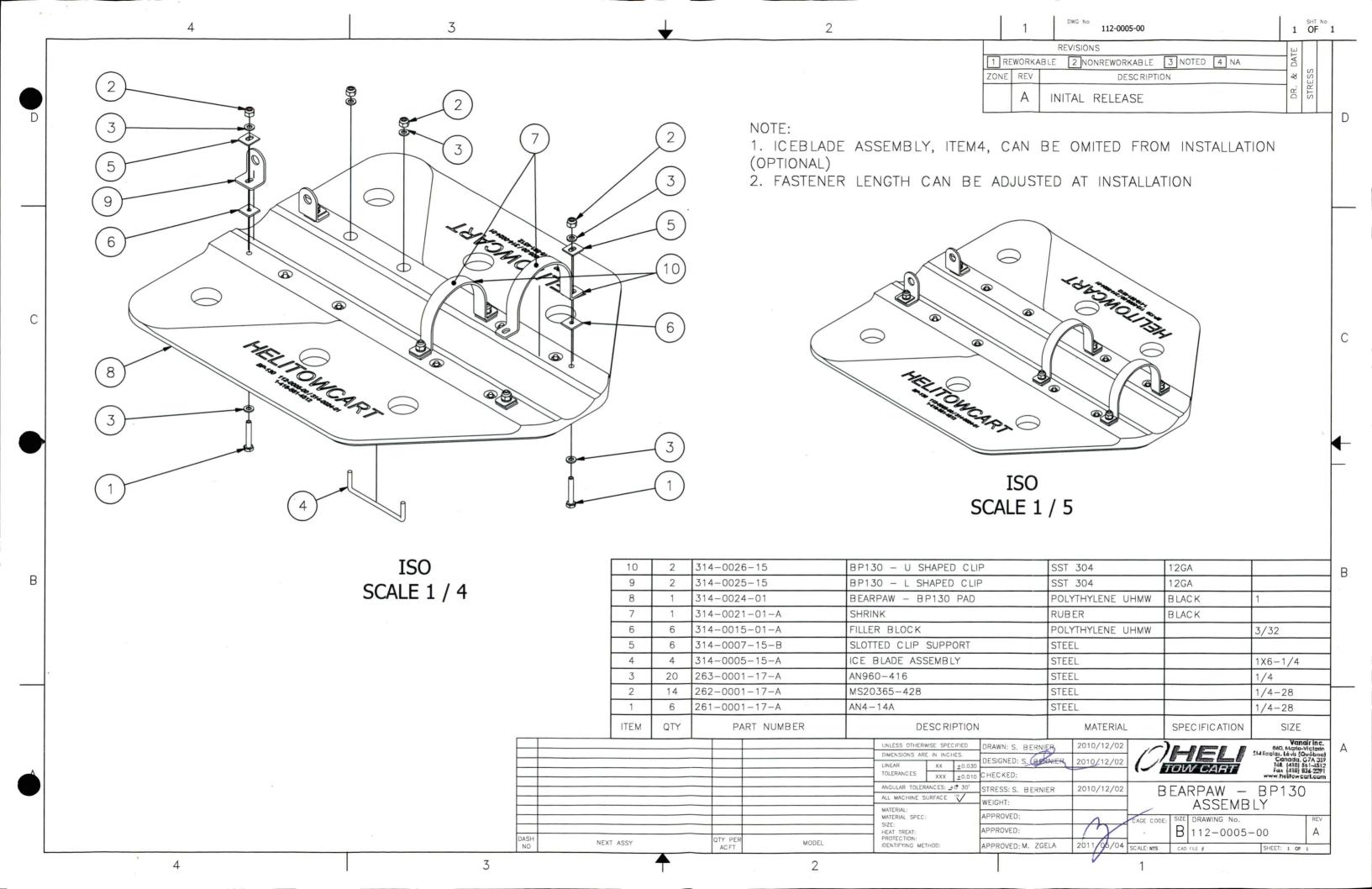












#### Nathalie Barbeau

From: Nathalie Barbeau [nbarbeau@helitowcart.com]

Sent: October-07-11 2:03 PM

To: 'Mirko Zgela'

Subject: Mes documents?

Allo Mirko,

M' As-tu posté mes documents?

Faut que je ferme mon dossier!!!

Ms Nathalie Barbeau VP Commercial Affairs

Helitowcart (Vanair inc.) 877A Alphonse-Desrochers St-Nicolas, Levis, Qc Canada, G7A 5K6 Tel: +1.418.561.4512

Fx: +1.418.836.4575 nbarbeau@helitowcart.com info@helitowcart.com www.helitowcart.com LETTRE & MIRKO
VS BP130
DOCUMENTS MANQUANTS

#### Nathalie Barbeau

From: Nathalie Barbeau [nbarbeau@helitowcart.com]

Sent: September-21-11 2:53 PM

To: 'Mirko Zgela'
Cc: 'Lucien Barbeau'

Subject: RAPPEL - BearPaws pour EC130 : En attente des documents finaux

Allo Mirko

Tel que demandé hier, voici la liste des éléments pour lesquels je suis toujours en attente de votre part:

1) Copie Originale du STC émis par Transport Canada pour l'ajout des BP130.

2) Le document AAC-CPL-BP-AS350/355/EC130-1000.

Ce document est listé au MDL et voici donc pourquoi j'en fais la demande.

Note: Lors de notre dernier audit de Transport Canada on m'a informé que je dois avoir en main tous les documents qui ont été requis lors de la soumission de la demande de STC.

Je te redemande donc à nouveau de me soumettre le AAC.

Si tu refuses toujours de me le soumettre, svp émettre une lettre officielle m'informant de ton refus de me le fournir et aussi de ton engagement à assurer qu'il soit protégé et conservé à long terme afin que Transport Canada ou nous-mêmes puissent y avoir accès facilement en cas de besoins.

3) Le STC américain.

Il est grand temps de terminer ce dossier. Svp adresser ces 3 besoins dès que possible.

Merci,

Ms Nathalie Barbeau VP Commercial Affairs

Helitowcart (Vanair inc.) 877A Alphonse-Desrochers St-Nicolas, Levis, Qc Canada, G7A 5K6 Tel: +1.418.561.4512

Fx: +1.418.836.4575 nbarbeau@helitowcart.com info@helitowcart.com www.helitowcart.com

#### Nathalie Barbeau

From: Nathalie Barbeau [nbarbeau@helitowcart.com]

Sent: August-02-11 3:08 PM

To: 'Mirko Zgela'

Cc: 'Lucien Barbeau'

Subject: Suivi: Documents officiels de Transport Canada pour le STC à jour avec BP130

Allo Mirko

J'ai pas encore reçu les documents originaux du STC. Sais-tu quand je les recevrai? (Je n'ai eu que la copie scannée).

Aussi, je n'ai pas reçu la lettre qui explique que tu refuses de me donner un exemplaire du document CPL pour les BP130.

J'aimerais beaucoup avoir le tout pour mon retour de vacances le 11 aout.

Merci

Ms Nathalie Barbeau VP Commercial Affairs

Helitowcart (Vanair inc.) 877A Alphonse-Desrochers St-Nicolas, Levis, Qc Canada, G7A 5K6 Tel: +1.418.561.4512

Fx: +1.418.836.4575 <u>nbarbeau@helitowcart.com</u> <u>info@helitowcart.com</u> <u>www.helitowcart.com</u> **Department of Transport** 

AWAITING APP'D

VERSION

Supplemental Type Certificate

2011 0679

This approval is issued to:

Number:

Q-SH06-24

Helitowcart 877A Alphonse-Desrochers

St-Nicolas, Levis, (Québec)
Canada G7A 5K6

Issue No.:

3

Approval Date:

May 04, 2011

Issue Date:

May 25, 2011

Responsible Office:

Quebec

Aircraft/Engine Type or Model:

See Continuation Sheet

Canadian Type Certificate or Equivalent:

See Continuation Sheet

Description of Type Design Change:

Installation of Helitowcart BearPaw

Installation/Operating Data,

Required Equipment and Limitations:

Installation Data:

For the R44 Series:

Installation of is to be performed in accordance with TC approved Helitowcart Master Document List HTC-MDL-BP-R44-1000, Revision C dated April 15, 2010 or later Transport Canada approved revision.

The BearPaw must be installed in accordance with Helitowcart Installation Instructions document "314-0011-00-D, BearPaw Model BP44, Installation Instructions – R44" as specified by Helitowcart Inc. Master Document List HTC-MDL-BP-R44-1000.

For the AS350 and AS355 Series:

Installation of is to be performed in accordance with TC approved Helitowcart Master Document List HTC-MDL-BP-AS350/355-1000, Revision F dated April 8, 2010 or later Transport Canada approved revision.

The BearPaw must be installed in accordance with Helitowcart Inc. Installation Instructions document "314-0020-00-E, BearPaw Model BP350, Installation Instructions – AS350/355" as specified by Helitowcart Master Document List HTC-MDL-BP-AS350/355-1000.

Conditions: This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated will not adversely affect the airworthiness of the modified product.

Jean Pierre Francoeur Aircraft Certification Engineer For Minister of Transport JP. Francoleen 514-633-3090





(Continuation Sheet)

For the EC130 Series:

Installation of is to be performed in accordance with TC approved Helitowcart Master Document List HTC-MDL-BP-EC130-1000, Revision A dated May 13, 2011 or later Transport Canada approved revision.

The BearPaw must be installed in accordance with Helitowcart Inc. Installation Instructions document "314-0031-00-A, BearPaw Model BP130, Installation Instructions – EC130" as specified by Helitowcart Master Document List HTC-MDL-BP-EC130-1000.

Limitations:

N/A

Required equipment:

N/A

Fleet Eligibility List			
Make	Model	Type Certificate Data Sheet	
Robinson	R44	H-97	
Robinson	R44 II	H-97	
Eurocopter	AS 350 D	H-83	
Eurocopter	AS 350 D1	H-83	
Eurocopter	AS 350 B	H-83	
Eurocopter	AS 350 B1	H-83	
Eurocopter	AS 350 B2	H-83	
Eurocopter	AS 350 B3	H-83	
Eurocopter	AS 350 BA	H-83	
Eurocopter	EC 130 B4	H-83	
Eurocopter	AS 355 E	H-87	
Eurocopter	AS 355 F	H-87	
Eurocopter	AS 355 F1	H-87	
Eurocopter	AS 355 F2	H-87	
Eurocopter	AS 355 N	H-87	

 End	

### **Department of Transport**

# Supplemental Type Certificate

This approval is issued to:

Helitowcart 877A Alphonse-Desrochers St-Nicolas, Levis, (Québec) Canada G7A 5K6

Number:

Q-SH06-24

Issue No.:

Approval Date:

May 04, 2011

Issue Date:

May 25, 2011

Responsible Office:

Quebec

Aircraft/Engine Type or Model:

See Continuation Sheet

Canadian Type Certificate or Equivalent:

See Continuation Sheet

**Description of Type Design Change:** 

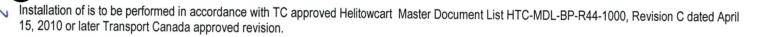
Installation of Helitowcart BearPaw

Installation/Operating Data,

Required Equipment and Limitations:

Installation Data:

r the R44 Series:



The BearPaw must be installed in accordance with Helitowcart Installation Instructions document "314-0011-00-D, BearPaw Model BP44, Installation Instructions - R44" as specified by Helitowcart Inc. Master Document List HTC-MDL-BP-R44-1000.

#### For the AS350 and AS355 Series:

Installation of is to be performed in accordance with TC approved Helitowcart Master Document List HTC-MDL-BP-AS350/355-1000, Revision F dated April 8, 2010 or later Transport Canada approved revision.

The BearPaw must be installed in accordance with Helitowcart Inc. Installation Instructions document "314-0020-00-E, BearPaw Model BP350, Installation Instructions - AS350/355" as specified by Helitowcart Master Document List HTC-MDL-BP-AS350/355-1000.

> Conditions: This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated will not adversely affect the airworthiness of the modified product.

> > Jean Pierre Francoeur Aircraft Certification Engineer For Minister of Transport

## **Department of Transport**

# **Supplemental Type Certificate**

(Continuation Sheet)

For the EC130 Series:

Installation of is to be performed in accordance with TC approved Helitowcart Master Document List HTC-MDL-BP-EC130-1000, Revision A dated May 13, 2011 or later Transport Canada approved revision.

The BearPaw must be installed in accordance with Helitowcart Inc. Installation Instructions document "314-0031-00-A, BearPaw Model BP130, Installation Instructions – EC130" as specified by Helitowcart Master Document List HTC-MDL-BP-EC130-1000.

Limitations:

N/A

Required equipment:

N/A

Fleet Eligibility List				
Make	Model Type Certificate Data Sheet			
Robinson	R44	H-97		
Robinson	R44 II	H-97		
Eurocopter	AS 350 D	H-83		
Eurocopter	AS 350 D1	H-83		
Eurocopter	AS 350 B	H-83		
Eurocopter	AS 350 B1	H-83		
Eurocopter	AS 350 B2	H-83		
Eurocopter	AS 350 B3	H-83		
Eurocopter	AS 350 BA	H-83		
Eurocopter	EC 130 B4	H-83		
Eurocopter	AS 355 E	H-87		
Eurocopter	AS 355 F	H-87		
Eurocopter	AS 355 F1	H-87		
Eurocopter	AS 355 F2	H-87		
Eurocopter	AS 355 N	H-87		

 End	
 End	

## Nathalie Barbeau

From:

Mirko Zgela [mirkoz@ats-ast.com]

Sent:

June-28-11 7:22 AM

To:

Nathalie Barbeau

Subject:

Information - AC 130 Bear Paw

Follow Up Flag: Follow up

Flag Status:

Red

Attachments:

Drawings BP130.zip; 314-0008-01-A BearPaw Pad Material UHMW 1of1.pdf; 314-0009-01-

A Propriété UHMW 1of1.pdf; ATS-1034-FTP-1000 Rev NC.pdf; ATS-1034-FTR-1000\_Rev\_NC.pdf; ATS-1034-STR-1000 Rev NC.pdf; HTC-314-0031-00-A \_Instruct

BearPaw Installation EC130.pdf; HTC-MDL-BP-EC130-1000\_Rev\_A.pdf

Bonjour Nathalie, à la demande de Lucien voir les documents ci-joints.

#### Salutations

Mirko Zgela M.Sc. MPM, CD

President

Aviatech Technical Services

Tel:

(819) 601-8049

Fax: Cell: (819) 377-7928

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# Master Document List

# Eurocopter Model EC 130 B4 Helicopters Installation of BearPaw Model BP130

Report: HTC-MDL-BP-EC130-1000 (Rev A)

APPROVED BY:

DATE:

MAI 13, 2011

Mirko Zgela

Design Approval Representative DAR #310

Page 1/4



Revision	Revision Date	Revision of Entry	Entered by
А	May 13, 2011	Initial issue	N/A



## 1.0 MASTER DOCUMENTS

Document #	Title	Revision Status	Approval by	Date
AAC-CPL-BP- AS350/355/EC130-1/	Compliance Plan – Eurocopter Model AS350/355/EC130 Series Helicopters – Installation of BearPaw Model BP350 and BP130	В	DAR 310	May 11, 2011
ATS-1034-FTP-1000	EC130 B4 BearPaw Installation - Flight Test Plan	NC	DAR 310	Apr 14, 2011
ATS-1034-FTR-1000	EC130 B4 BearPaw Installation - Flight Test Report	NC	DAR 310	May 04, 2011
ATS-1034-STR-1000	Structural Substantiation – Helitowcart BearPaw Model BP130	NC	DAR 310	May 04, 2011
HTC-314-0031-00	BearPaw Model BP130 – Installation Instructions - EC130 B4 Helicopters	А	DAR 310	May 04, 2011

## 2.0 MASTER DRAYTIGS

Drawings #	Title	Revision Status	Approval by	Date
VNR084	BearPaw - Iceblade	R01	DAR 310	Apr 24, 2006
VNR085	BearPaw - Iceblade Threaded Rod	R01	DAR 310	Apr 24, 2006
<b>314-0</b> 005-15 <b>(VNR</b> 086)	earPaw - Iceblade Assembly	A (R01)	DAR 310	Apr 24, 2006
<b>314-00</b> 07-15 (VNR089)	earpaw – Slotted Clip Support	B (R04)	DAR 310	July 31, 2006
<b>314-00</b> 15-01	Filler Block 1/8"	Α	DAR 310	Aug 8, 2006
<b>112-000</b> 5-00	SearPaw BP130 - Assembly	А	DAR 310	May 04, 2011
<b>314-0</b> 024-01	≳arPaw - BP130 Pad	А	DAR 310	May 04, 2011
<b>314-0</b> 025-15	P130 - L Shaped Clip	А	DAR 310	May 04, 2011
<b>314-0</b> 026-15	P130 - U Shaped Clip	А	DAR 310	May 04, 2011



REFERENCE

UMENTS

Document #	Title	Revision Status	Approval by	Date
<b>314-0</b> 009-01-A	Itra High Molecular Weight Polyethylene - Typical Properties	А	N/A	May 24, 2006
<b>314-0</b> 008-01-A	erial Properties - UHMW TIVAR	Α	N/A	May 24, 2006
<b>314-0</b> 017-05-A	at Shrink Specifications	Α	N/A	Sept 6, 2006



Aviatech Services Techniques Inc. 3005, rue Lindbergh Trois-Rivières, Québec, G9A 5E1 Tél: (819)601-8049 Fax: (819) 377-7928

# Aviatech Technical Services Inc.

# Structural Substantiation Helitowcart BearPaw Model EC130

Report: ATS-1034-STR-1000 Rev NC

PREPARED BY:

Simon Bernier

Staff Specialist - Structure

APPROVED BY:

Mirko Zgela

Design Approval Representative

DATE: MAY 04, 2011

DATE: DEC 21, 2010

**DAR #310** 

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or noted

## RECORDS OF REVISIONS

Revision	Revision Date	Revision of Entry	Entered by
NC	May 04,2011	Initial	M.Z

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## 1.0 Introduction

## 1.1 Background

Helitowcart is a company that design, manufacture and distribute ground handling devices for light to medium weight helicopters. Its mission is to design and to provide reliable and secure products, capable of multiple applications while incorporating superior aesthetics. In order to increase its product line basis, Helitowcart has recently developed a BearPaw design for the Robinson R44 helicopter and the model BP350 BearPaw is a similar design that can be installed on the AS350 and AS355 series helicopters. The BP130 is to enlarge the Eurocopter family product on the EC130 model. This design requires also airworthiness approval.

## 1.2 Purpose

This document provides the structural substantiation for the installation of the Helitowcart BearPaw Model EC130. More specifically this report will demonstrate compliance to the following CAR 527 airworthiness requirements, see Table 1:

CAR 527	Requirements
27.301	Loads
27.303	Factor of Safety
27.305	Strength & Deformation
27.307	Proof of structure
27.321	General
27.337	Maneuvering conditions
27.501	Ground Load Conditions - Landing
27.301	Gear with Skids
27.603	Material Strength Properties

Table 1- CAR 527 Airworthiness Requirements

#### 1.3 Modification Description

The Helitowcart BearPaw's are made of machined UHMW TIVAR® polymer 1.0 in. sheet material. This material combines high-impact performance, low friction and good resistance to chemical. Its high durability provides superior performance. The UHMW Polymer has a lower coefficient of friction than glass. Together with its self lubricating characteristics is an ideal material for this design application where sliding contact is encountered.

The machined BearPaw is attached to the R/H and L/H helicopter aft skid tubes where the aft cross tube attaches. The BearPaw is attached to the skids using three stainless steel bands

and six AN-4 bolts. The BearPaw pad has a machined recess on its centerline that perfectly matches the cross tube contour providing a smooth skid bearing loads. The total weight of the installation is less than 21 lbs. A typical BearPaw Model BP130 assembly is shown in Figure 1.

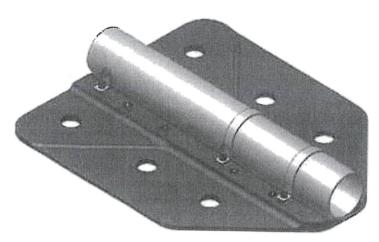


Figure 1 - BearPaw EC130 Assembly

## 1.4 Applicable Drawings

The following drawings define the structural configuration of the BearPaw Model BP130 and have been used in the analysis.

Drawings #	Title	Revision Status	Date
VNR084	BearPaw - Iceblade	R01	Apr 24, 2006
VNR085	BearPaw - Iceblade Threaded Rod	R01	Apr 24, 2006
314-0005-15 (VNR086)	BearPaw - Iceblade Assembly	A (R01)	Apr 24, 2006
314-0007-15 (VNR089)	Bearpaw - Slotted Clip Support	B (R04)	July 31, 2006
314-0015-01	Filler Block 3/32" 16" 55	A	Aug 8, 2006
112-0005-00	BearPaw BP130 – Assembly	A	May 04, 2011
314-0024-01	BearPaw - BP130 Pad	A	May 04, 2011
314-0025-15	BP130 - L Shaped Clip	A	May 04, 2011
314-0026-15	BP130 - U Shaped Clip	A	May 04, 2011

Table 2 - Applicable Drawings



## 2.0 STRUCTURAL LOADS

#### 2.1 General

The helicopter BearPaw will be subjected to both maneuvering and ground loading actions. The BearPaw has a very small cross-section and is of light weight construction, as such, the only significant loads will be generated by the ground loading actions of the helicopter resting on its skids. Consequently only the ground loads will be considered in the analysis.

#### 2.2 Ground Loads

From reference [1], the ground load have been extracted. Load acting under the BearPaw  $(L_{BP})$  and the drag force  $(F_d)^1$ 

 $L_{BP} = 3307 \text{ lbs}$  $F_{d} = 562 \text{ lbs}$ 

Since the EC130 is lighter using the same loading condition is conservative.

#### 2.3 Factors

The following factors will be used in the detailed stress analysis if required:

- a) a factor of 1.5 to go from limit to ultimate load
- b) a factor of 1.15 to be used as fitting factor since the equipment will be subjected to significant vibrations; and
- c) no special factor is needed.

<sup>&</sup>lt;sup>1</sup> The drag force is the friction load during the landing.

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## 3.0 DETAILED STRUCTURAL ANALYSIS

#### 3.1 General

The following failures modes have been evaluated;

- a) Finite element study of BearPaw pad resulting from the combined loading F<sub>d</sub> and L<sub>BP</sub>;
- b) Failure of the stainless steel clip due to the application of F<sub>d</sub>;
- Failure in shear of the stainless steel clip attaching bolts due to the application of F<sub>d</sub>.
- d) Failure in bearing of the BearPaw in bolts holes due to the application of F<sub>d</sub>.

## 4.0 FINITE ELEMENT ANALYSIS

## 4.1 Finite Element Model Description

The BearPaw is studied by finite element software Ansys Workbench 11. The 6x AN4 bolt are represented by the "D" to "I" remote displacement witch constrain the BearPaw in the  $\pm Y$  direction. The skid is represented with the "B" frictionless support and constrain the BearPaw in the  $\pm Z$  direction. The load applied under the BearPaw is "A" with represent the landing load ( $L_{BP}$ ). Finally, the load "C" represent the friction load during the landing ( $F_D$ ). See Figure 2 for the finite element model in Ansys Workbench 12.

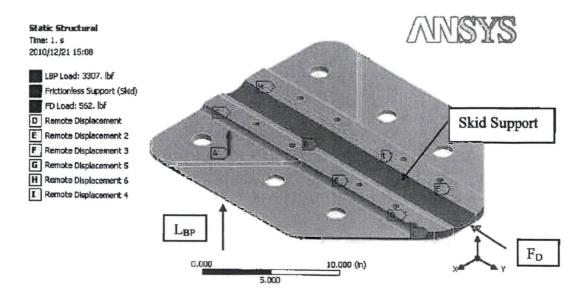




Figure 2 - Finite element Model Representation

The mesh is composed of the tetrahedral elements SOLID187. Witch is well suited to modeling irregular meshes. All holes of the model have been refined. The mesh is composed of 163 669 nodes and 101 394 elements. See Figure 3 for the finite element model mesh representation.

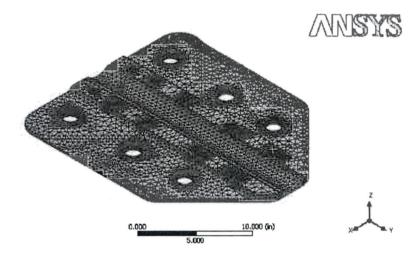


Figure 3 - Finite Element Model Mesh Representation

#### 4.2 Finite Element Model Result

The Figure 4 and Figure 5 show the Von Mises stress result.

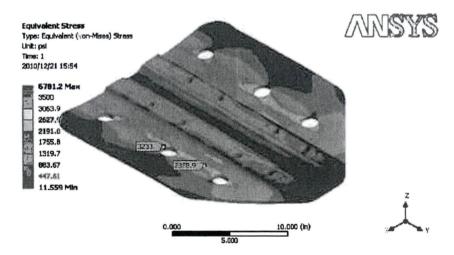


Figure 4 - Top BearPaw Von Mises Stress

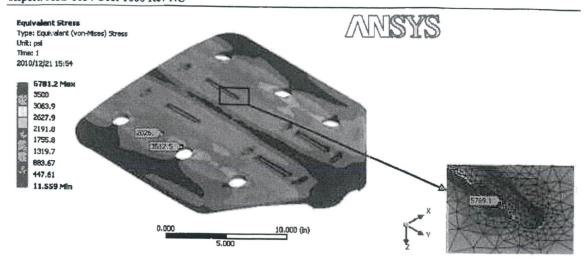


Figure 5 - Bottom BearPaw Von Mises Stress

The maximum Von Mises stress is 3513 psi. There is a peak of stress in the ice blade pocket, but it is not considerable because it is on a sharp edge and the material is elastic.

As stated earlier the BearPaw is made of UHMW and Table 3 shows the margin of safety calculated as:

$$M.S. = \frac{Material Strenght}{(Calculated Stress*F.S)} - 1$$

Material UHMW Ultimate	Von Mises	Factor of	Margin of
Tensile Strength (psi)	Stress (psi)	Safety	Safety
6800	3513	1.5	0.29

Table 3 - BearPaw Margin of Safety

## 5.0 ATTACHMENTS ANALYSIS

## 5.1 Attachment Load Description

The drag load on the BearPaw is redistributed equally on the three attachment clip. The loading distribution is as shown in Figure 1. All calculation was made in Excel from reference [2] and was copied here.

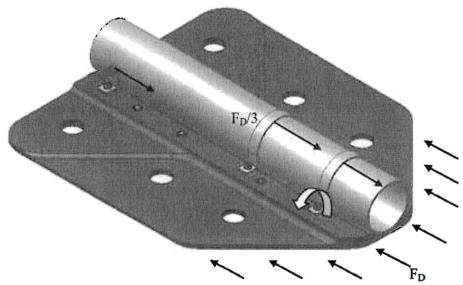


Figure 6 - Attachment Load Representation

## 5.2 Failure of the Stainless Steel Clip

Figure 7 shows the front view of the BearPaw installation. The Lm distance goes to the BearPaw surface instead of the filler block, in case, in the future, the clip would be designed in full length. The Clip is made of stainless steel 304 have a shear stress of 50 Ksi (Ref. [4]).

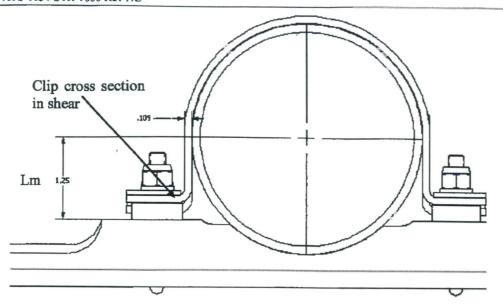


Figure 7 - Stainless Steel Clip Representation

Assuming that the local moment will be distributed equally between the 12x attachment bolts (two BearPaws), the local moment will be given by:

$$F_{D} (lbs) = 562$$

Lm = Distance between the mid section of the skid tube to the top of the Bear Paw

$$Lm (in) = 1.25$$

 $M_D$  = The local moment of the clip due of the drag

$$M_D = (FD * Lm)/12$$

$$M_D (in*lbs) = 58.54$$

This local moment will be reacted by shear stresses resulting form the applied torsion in the clip cross section. The shear stresses  $F_{MD}$  will be given by:

t<sub>C</sub> = thickness of the clip

$$t_{\rm C}$$
 (in) = 0.109

 $b_C$  = width of the clip

$$b_{\rm C}$$
 (in) = 0.75

 $F_{MD}$  = Stress of the clip caused by the moment of the drag

$$F_{MD} = (3 \times M)/(b \times t^2)$$

$$F_{MD}$$
 (psi) = 19709

 $F_{SU}$  (psi) = Clip material ultimate shear stress

$$F_{SU}$$
 (psi) = 50000  
 $F.S$  = 1.50  
 $M.S. = (F_{SU} / (F_{MD}*F.S) -1$   
 $M.S. =$  0.69

Even negative this result is conservative, because the friction between the BearPaw and the skid was not considered.

## 5.3 Failure in Shear of the Attaching Bolts

The AN4 bolts take 3600 lbs in shear<sup>2</sup> and F<sub>D</sub> is 562 lbs witch is minimalist.

## 5.4 Failure in Bearing of the BearPaw in Bolts Holes

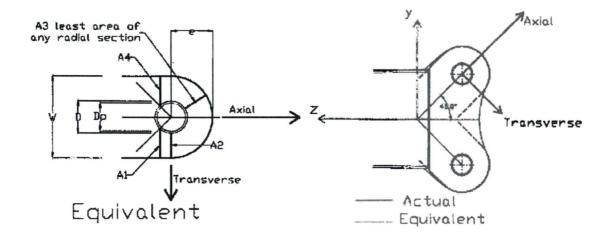
The bearing of the BearPaw is calculated as per Brhun (ref [3]);

 Material:
 UHMW

 Ftu
 6 800 Psi

 Fsu
 3 500 Psi

 Fty
 3 400 Psi



<sup>&</sup>lt;sup>2</sup> Reference [3] Table D1.1

## **Lug Dimention Defenition**

t(in) =	0.670		
D(in) =	0.250		
e (in) =	2.000		
W(in) =	2.000		
Fa (lbs) =	586.00	Axial Load	
Ft (lbs) =	0.00	Transverse Load	
F.S. =	1.73	Factor of Safety	
$Abr (in^2) =$	0.1675	Abr = D*t	
D/t =	0.37		
e/D =	8		
t/D =	2.68		
Kbry	2.8	Fig D1.14	
Pbry (lbf) =	1 595	Pbry = Kbry*Abr*Fty	Shear-Bearing yeild
MSbry	0.58	MSbry = Pbry / (Fa*FS)-1	

## **6.0 CONCLUSIONS**

The modification of the BearPaw EC130 and BearPaw EC130 assembly is structurally acceptable.

## 7.0 REFERENCES

- [1] STR-BP-AS350/355-1000 Rev NC "Structural Substantiation Helitowcart BearPaw Model BP350" dated November 26, 2006
- [2] ATS-1034-XLS-1000 Rev NC "BearPaw EC130 Calculation" dated December 21, 2010
- [3] Bruhn, "Analysis and Design of Flight Vehicle Structures", Second Edition, June 1973.
- [4] MIL-HDBK-5H, "Metallic Material and Elements for Aerospace Vehicle Structures" December 1998

Structural Substantiation Helitowcart BearPaw Model EC130 Report: ATS-1034-STR-1000 Rev NC

ANNEX A - UHMW TIVAR PROPERTY

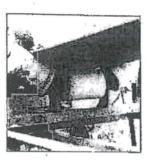
Catalogue des produits et services

41

## Propriétés du UHMW TIVAR®







	PHYSICAL PROPERTU	EB	
MIDPERTY	THEIT METHOD	UNT	TYPICAL VALUE
Ultimate Tanalle Siningin d	ASTM D-988 ASTM D-888 ASTM D-988 ASTM D-988 ASTM D-988	P. S.	G.P.CO G.

	DEFORMA	MON UNDE	THE COMPAN	BBB(DN - 95		7	PERMANENT	DEPORTMENTON
	PER		INITIAL LOADING			APTER REMOVAL OF LOAD		
LEDGE A	COMPRESSION	TO MIN.	IBR WIN.	1000 MIN.	1 DAY	ES DAYE	AFTER 1 MAN.	AFTER 24 HRS.
	820 830	2.4	1.7	1.8	1.9	24	0,0	Q.9
20°	1140	8.0	4.0 3.0	4.8	8.0	8.0	2.7	7.2

e strength up to 80°C. able reaction up to 80°C. La

furn hypochlorete and most aqueous solutions of mo rocarbons and halogenated hydrocarbons -limited re

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Heiltowcart 314-0008-01-A 2008-05-23 1 of 1

ATS - 1034 - FTR-1800- BONG

## ATS-1034-FTP-1000 Rev NC

# TCCA – Simple External Modification EC130 B4 BearPaw Installation - Flight Test Plan

Aircraft Type: Eurocopter EC1	30 B4	Registration / Ser No:	C-FXSH / 4968			
Modification Description: Installation of Helitowcart BearPaw as per STC: SH06-24 Issue #3						
Modification Drawing Number:	Installation conforms to	: HTC-MDL-BP-EC130	0-10000 Rev NC			
Installation is performed as per: HTC-314-0031-00-A, "BearPaw Model BP130 Installation Instructions – EC130 Helicopter", Rev A.						
Date of Flight:						
Date of Flight:		Location of Flight:	CYQB – Capital Helicopter Inc.			
Test Weight:		Test CG:				
Configuration (List All External M	ods): Configuration #1	: Clean helicopter (Base	eline)			
	Configuration #2 00-A, "BearPaw A.	: BearPaw installed as p Model BP130 – Installa	per HTC-314-0020-00-A, HTC-314-0031- tion Instructions – EC130 Helicopter", Rev			
Note: Two flights will be required,	Note: Two flights will be required, one clean to be used as baseline the other with the BearPaw installed.					

## **TEST RESULTS**

Test	Characteristics to Look For	Initial if Satisfactory
527.171 – Stability General	Perform at least three take/landing from a soft soils/snow to ensure that the bear paw does not create any abnormal conditions.	
527.309 – Design Limitation (c) & (d) 527.143 – Controllability and Maneuverability	Perform forward rearward and sideward flight (left & right) at maximum speed. Note the following:  - Abnormal vibration of the airframe/Landing gear  - Abnormal vibration of BearPaw  - Large displacements of BearPaw/Landing gear  - Controllability of the helicopter	
527.251 - Vibration	Perform forward rearward and sideward flight (left & right) at maximum speed. Note the following:  - Abnormal vibration of the airframe/landing gear  - Abnormal vibration of BearPaw  - Large displacements of BearPaw/Landing Gear  - Controllability of the helicopter	

527.173 Static Longitudinal Stability 527.175 Demonstration of Static Longitudinal Stability – (Cruise)

Cruise:	3000	Ft	PAlt
---------	------	----	------

Set power to achieve a trim condition at 0.9Vh. Note the following:

Rotor RPM:	
Q:	
N1:	
N2:	

The collective stick should be fixed in that position; usually by applying sufficient friction to ensure that it is not inadvertently moved. Increased or decreased in about 10-knot increments, stabilizing on each speed and recording the longitudinal cyclic position, then decreasing speed through the same altitude band.

Speed	Speed (IAS)	Cyclic Position (1)
+10		
+10		
+10		
Vh		
-10		
-10		
-10		

Cyclic position from reference at (Vh).

Can trim conditions can be easily achieved.

Climb: 2500 Ft PAlt

Set power to achieve a trim condition at 0.9Vh. Note the following:

Rotor R	PM:	
Q:		
N1:		
N2:		

The collective stick should be fixed in that position; usually by applying sufficient friction to ensure that it is not inadvertently moved. Decrease climb speed in about 10-knot increments, stabilizing on each speed and recording the longitudinal cyclic position, then decreasing speed through the same altitude band. Target alt 3000 ft.

Speed	Speed (IAS)	Cyclic Position (1)	Climb Rate
Vh			
-10			
-10			
-10			

Cyclic position from reference at (Vh).

Can trim co	onditions in climb	can be easily achieved.	
Autorotati	ion: 3500 Ft PAlt		
Set power t	o achieve a trim	condition at 0.9Vh. Not	e the following:
Initiate an a 10-knot inc longitudina	rements, stabilizi	ased or decreased autoro	cording the
Speed	Speed (IAS)	Cyclic Position (1)	Decent Rate
+10		(-/	
+10			****
Vh			
-10			
-10			

527.177 Static Directional Stability	Static Dire	ectional Stability					
Stability	Climb:	Climb:					
	70 KIAS. Apply L/H helicopter	With MCP (Maximum Continuous Power) established, initiate a climb at 70 KIAS.  Apply L/H and R/H rudder input to approximately 10 deg sideslip. The helicopter directional stability must be positive steadily increasing directional control input for increasing angles of sideslip.					
	Repeat the	above maneuver at 1	0 KIAS increment up to 95 KI	AS.			
	Cruise:						
	stability m	proximately 10 deg si	at 60 KIAS. Apply L/H and R/I deslip. The helicopter direction y increasing directional contro	nal			
	Speed	Speed (IAS)	Sideslip positive return	]			
	60						
	+10						
	+10			]			
	+10			]			
	+10			1			
	+10			1			
	+10			1			
		y abnormal vibrations	on in directional stability.				
527.629 - Flutter 527.143 – Controllability and Maneuverability	- Abnorma - Abnorma - Large di		aw	lade			
I hereby attest that I have flown ( the above modification(s) installe when the modified with the above	ed and that this	s aircraft exhibited the	gistration) (Serial N e flight characteristics and perf	Number) ormance of a	with standard EC130		
Pilot I/C Signature:			Date:				
Pilot's Name:			Pilot's License No:				
If applicable - DAR's Signature			DAR's /No:				

ATS-1034- FTR-1000 Rev NC

ATS-1034-FTR-1000 Rev NC

# TCCA – Simple External Modification EC130 B4 BearPaw Installation – Flight Test Report

	7			7		
Aircraft Type:	Eurocopt	er EC130 B4		Registratio	n / Ser No:	C-FXSH / 4968
Modification Description: Installation of Helitowcart Be			earPaw as pe	r STC: SH0	6-24 Issue #3	
Modification Drawing: Installation		conforms to: HTC-MDL-BP-EC130-10000 Rev NC				
		is performed as per: HTC-314-0031-00-A, "BearPaw Model BP130 – Installation Instructions – EC130 , Rev A.				
the installar		formity inspection performed by DAR #310 prior to flight. Small adjustments were made to bolt length to suit tion. Installation drawing annotated to reduce by one dash the bolt length on a few areas. See figure (1) for w installed on the helicopter.				
	<u> </u>					earPaw installed on Test Helicopter
Date of Flight:	March 24	, 2011		Location of	Flight: C	YQB – Capital Helicopter Inc.
Test Weight:	4680 lbs	Test CG: 133.2 in				
Configuration (List All External Mods): Configuration #		#1: Clcan helicopter (Baseline)				
Configuration # Instructions – E			2: BearPaw in C130 Helicop	nstalled as p oter", Rev A	er HTC-314-0031-00-A, "BearPaw Model BP130 - Installation	
Note: Two flights	were done	:				340
Flight #	#1 – Config	uration #2 (B	earPaw installed)	- 0.8 hrs		
wat -						

## TEST RESULTS

Flight #2 - Configuration #1 (Baseline) - 0.6 hrs

Test	Characteristics to Look For	Initial if Satisfactory
527.171 Stability General	Performed at least three take-off and landings from a soft soils/snow to ensure that the bear paw does not create any abnormal conditions.	
	Results:	
	Take-off and landing were performed in muddy soil on the runway side. No restriction created by the BearPaw. No difference between the baseline and the BearPaw configured aircraft.	

	ATS-1034-FTR-1000 Rev NC
527.309 – Design Limitation (c) & (d) 527.143 – Controllability and Maneuverability	Perform forward rearward and sideward flight (left & right) at maximum speed.  Note the following:  - Abnormal vibration of the airframe/Landing gear  - Abnormal vibration of BearPaw  - Large displacements of BearPaw/Landing gear  - Controllability of the helicopter
	Results:
	Performed side way flight on runway 24 up to 17KIAS ground speed and 10 KIAS rearward flight. Sideway flight to L/H side more difficult to control but no difference between the baseline and the BearPaw configured aircraft. No abnormal vibrations.
527.251 - Vibration	Perform forward rearward and sideward flight (left & right) at maximum speed.  Note the following:  - Abnormal vibration of the airframe/landing gear  - Abnormal vibration of BearPaw  - Large displacements of BearPaw/Landing Gear  - Controllability of the helicopter  Results:
	Performed side way flight on runway 23 up to 17KIAS ground speed and 10 KIAS rearward flight. Sideway flight to L/H side more difficult to control but no difference between the baseline and the BearPaw configured aircraft from a vibration point of view.
527.173 Static Longitudinal Stability	Cruise: 2000 Ft PAlt Set power to achieve a trim condition at 0.9Vh. Note the following:
27. 175 Semonstration of Static Longitudinal Stability – (Cruise)	Rotor RPM: 393 Q: 80% N1: 91.9 % N2: 393 (Match to RPM)  The collective stick should be fixed in that position; usually by applying sufficient friction to ensure that it is not inadvertently moved. Increased or decreased in about 10-knot increments, stabilizing on each speed and recording the longitudinal cyclic position, then decreasing speed through the same altitude band.  Results:  Cyclic travel on the ground with rotor not turning: Cyclic Full Forward: 10.6 Cyclic Full Aft: 15.3
	Speed Speed (IAS) Cyclic Position Cyclic Position (1)

Speed	Speed (IAS)	Cyclic Position BearPaw	Cyclic Position (1) Baseline
+10	95	12.4	12.3
+10	105	12.0	12.1
+10	115	11.8	11.7
Vh	125	11.6	11.5
-10	135	11.2	11.1

The two configurations produced similar stick gradient of 0.30 in/10 knots with positive cyclic forward producing a increase in speed. Note: Tape measure not sensitive enough for characterize the difference created by the BearPaw. Most likely, no differences considering the BearPaw generated drag versus the size of the helicopter.

527.173 Static Longitudinal Stability

527. 175 Demonstration of Static Longitudinal Stability – (Cruise) Cyclic position from reference at (Vh). 3.7" from full aft.

Can trim conditions can be easily achieved. Yes

Climb: 2000 Ft PAlt (Started 200 ft below until trim)

Set power to achieve a trim condition at 0.9Vh. Note the following:

Rotor RPM: 393

Q: 80% N1: 91.9 %

N2: 393 (Match to RPM)

The collective stick should be fixed in that position; usually by applying sufficient friction to ensure that it is not inadvertently moved.

Decrease climb speed in about 10-knot increments, stabilizing on each speed and recording the longitudinal cyclic position, then decreasing speed through the same altitude band. Target alt 2000 ft.

Speed	Speed (IAS)	Cyclic Position (1)	Climb Rate
Vh	123	11.5	0 ft/min
-10	110	11.8	800 ft/min
-10	100	12.0	1200 ft/min
-10	90	12.25	1500 ft/min

Cyclic position from reference at (Vh). 3.7" from full aft.

Can trim conditions in autorotation can be easily achieved. Yes.

Stick gradient in climb with BearPaw measured at 0.22in/10 KIAS. Stick aft produced positive climb rate and reduction in speed.

Autorotation: 2500 Ft PAlt at 100 KIAS

Rotor RPM: 393

Q: 52% N1: 87.5 %

N2: 393 (Match to RPM)

Initiate an autorotation increased or decreased autorotation speed in about 10-knot increments, stabilizing on each speed and recording the longitudinal cyclic position, then decreasing speed through the same altitude band. Target alt 2000 ft.

Speed	Speed (IAS)	Cyclic Position (1)	Decent Rate
100	100	13.0	3000 ft/min
90	90	13.2	2800 ft/min
80	80	13.25	2200 ft/min
70	70	13.3	1900 ft/min

Can trim conditions in climb can be easily achieved: Yes

Cyclic stick gradient approximately 0.1 in/10 KIAS in trim speed. Moving the cyclic aft produces a reduction decent rate and autorotation speed. Baseline autorotation not performed because the measurement of cyclic position extremely difficult.

## 527.177 Static Directional Stability

Cruise:

With the power set for a cruise at 60 KIAS. Apply L/H and R/H rudder input to approximately 10 deg sideslip. The helicopter directional stability must be positive steadily increasing directional control input for increasing angles of sideslip.

Speed	Speed (IAS)	Sideslip positive return	
60	60	Positive L/H /Neutral R/H	
+10	70	Positive L/H /Neutral R/H	
+10	80	Positive L/H /Neutral R/H	
+10	90	Positive L/H /Positive R/H	
+10	100	Positive L/H /Positive R/H	
+10	100	Positive L/H /Positive R/H	
+10	110	Positive L/H /Positive R/H	

- Note any abnormal vibrations. No vibration
- Note any abnormal degradation in directional stability. Below 90 knots on right pedal input the helicopter is fairly neutral on both configurations with and without BearPaw.

#### 27.629 Flutter

Perform a shallow dive at 1.1 VNE. Note the following

527.143 Controllability and Maneuverability

- Abnormal vibration of the airframe, landing gear and rotor blade
- Abnormal vibration of BearPaw/Landing Gear
- Large displacements of BearPaw
- Controllability of the helicopter

No *abnormal* vibration at 1.1 VNE between the two configurations but lots of wind inside the cabin through the door seals. The pilot was concerned about window cracking at high speed. This seems to have happen on previous helicopters at high speed during the cold weather. Did not stay at VNE for very long.

With the above modification(s) installed the helicopter exhibited the flight characteristics and performance of a standard EC130 B4.

Pilot's Name:

Olivier Moyat

Pijot's License No: CH 175386

If applicable - DAR's Signature

Mirko Zgela

DAR's /No:

#310



# BearPaw Model BP130 Installation Instructions – EC130

## **TABLE OF CONTENTS:**

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## 314-0031-00-A BearPaw Model BP130 Installation Instructions – EC130

#### INTRODUCTION

#### Scope

This installation instruction describes the step-by-step approach to install and to perform maintenance of the Helitowcart BearPaw Model BP 130 (P/N 112-0005-00) for the EC130-B4 helicopters.

#### General

The Helitowcart BearPaw is made of machined UHMW TIVAR® polymer sheet. This material combines high-impact performance, low friction and good resistance to chemical. Its high durability will provide superior performance when installed on your helicopter. Any question regarding the Helitowcart BearPaw system shall be directed to Helitowcart Customer Support as indicated in Table (1):

#### Table 1 - Helitowcart Customer Support

Care of	Mailing Address	Phone, Fax & Email:
Customer Support	877A Alphonse-Desrochers	Tel:1 (418) 561-4512
Helitowcart BearPaw	St-Nicholas, Levis, Quebec,	Fax:1 (418) 836-4575
Helitowcart (Vanair inc)	Canada, G7A 3K6	info@helitowcart.com

## **Helicopter Effectivity**

This installation instruction applies to the following helicopter models:

#### Table 2 - Helicopter Model Effectivity

Make	Model	Transport Canada Type Certificate Data Sheet
Eurocopter	EC 130 B4	H-83

### Installer Responsibilities

The installer shall ensure that the installation of the Helitowcart BearPaw does not conflict with any other part of the helicopter configuration. Technicians performing this installation should be familiar with A/C work and should have been familiarized with the different Helitowcart BearPaw system components prior to performing a first time installation. All steps in this procedure must be followed. Deviations from the procedures may result in potential structural failure or equipment malfunction and will result in a non-compliant installation.

### INSTALLATION

#### BearPaw Installation

Reference Documentation:

[1] Helicopter Maintenance Manual EC130 as applicable.



## 314-0031-00-A BearPaw Model BP130 Installation Instructions – EC130

## Step 1: Helicopter Preparation

- Ensure the helicopter is safe for maintenance;
- Lift the helicopter using the manufacturer recommended practice provided in Ref [1] as applicable to your helicopter model to allow a ground clearance of the skid in the area of the aft cross tube of approximately 1 ½" (38mm);
- Remove Aft AN5 bolt;

Note: The BearPaw Model BP130 (P/N 112-0005-00) can be installed with or without the skid tube wear shoes.

## Step 2: IceBlade Installation

Note: The BearPaw Model BP130 (P/N 112-0005-00) can be installed with or without the IceBlades

- With IceBlade Option
- Install ice blades (Qty: 4) (Iceblades P/N 314-0005-15) under BearPaw pad as per drawing (112-0005-00) provided at Annex A.
- Secure ice blades with washer (Washer P/N 263-0001-17) and nut (P/N 262-0001-17).

#### Step 3: BearPaw Installation

- Position the BearPaw under the skid as shown in Figure 1 with narrow edge pointing forward.
- Insert washers (P/N 263-0001-17) through all six bolts: 6x(261-0001-17);
- Insert bolts (P/N 261-0001-17) and washer (Washer P/N 263-0001-17) through BearPaw pad as per drawing (112-0005-00) provided at Annex A;
- Insert filler blocks (P/N314-0015-01) in the six bolts as per drawing (112-0002-00) provided at Annex A:

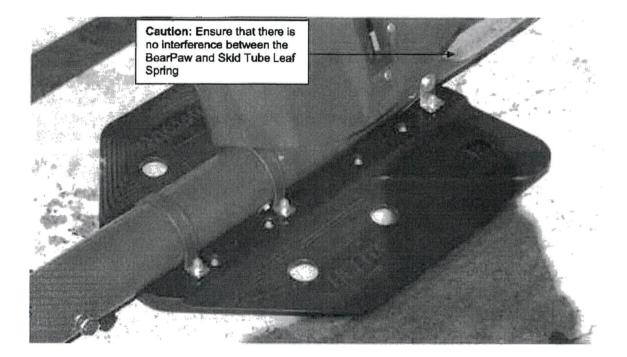
Note: The use of filler blocks (P/N314-0015-01) may be replaced or complemented by the use of washers (P/N 263-0001-17) to fill in the gap. Bolts (P/N 261-0001-17) may be replaced by longer or shorter AN4 bolts as required.

- Insert both U-shaped clips (P/N 314-0026-15) through forward bolts: 4x(261-0001-17);
- Insert both L-shaped clips (P/N 314-0025-15) through aftward bolts: 2x(261-0001-17);
- Insert slotted clip supports (P/N 314-0007-15) through all six bolts. Position slotted clip supports with rounded edge toward helicopter skid;
- Insert washer (P/N 263-0001-17) & screw nuts (P/N 262-0001-17) for a tight fit. Max. torque on nuts 60 in.-lb;
- Re-install removed AN-5 Bolt from step one;
- Remove helicopter from lift;
- Amend Weight & Balance records as required using data provided in Table 3.



# 314-0031-00-A BearPaw Model BP130 Installation Instructions – EC130

Figure 1 - BearPaw Model BP130 (P/N 112-0005-00) - Alignment on Skid



#### BearPaw Removal

#### Step 1: Helicopter Preparation

- Ensure the helicopter is safe for maintenance;
- Lift the helicopter using the manufacturer recommended practice provided in Ref [1] to allow a clearance of the skid in the area of the aft cross tube of approximately 1 ½" (38mm);

#### Step 2: BearPaw Removal

- Remove aftward AN5 bolt;
- Remove nuts (P/N 262-0001-17), slotted clip support (P/N 314-0007-15) on U-shaped clips (P/N 314-0026-15)2x and L-shaped clips (P/N 314-0025-15);
- Remove washers (P/N 263-0001-17), U-shaped clips (P/N 314-0019-15), L-shaped clips (P/N 314-0025-15), filler blocks (P/N314-0015-01) and remove BearPaw pad (P/N 314-0024-01);
- Inspect skid tubes to confirm serviceability;
- Re-install aftward AN5 bolt;
- If the skid tube shoes have been removed, re-install shoes as per reference [1];
- Complete installation by putting helicopter back to normal position by removing lift status;
- · Amend Weight & Balance records as required using data provided in Table 3.

#### Weight & Balance

The following information should be used to amend the helicopter weight and balance information following the installation or removal:

Table 3 - Weight & Balance Data

Item	Weight	Lateral		Longitudinal	
	vveigni	Arm	Moment	Arm	Moment
Helitowcart BearPaw Model BP130 (P/N 112-0005-00)	20.0 Lb 9.1 Kg	N/A	N/A	182.2 in. 462.9 cm	3644.0 in-lb 42.12 m-kg

Note: Weight and moment provided are for full kit installation.

#### **Parts Lists**

The Helitowcart BearPaw detailed parts list is as follow:

Table 4 - Parts List

Table 4 - 1 arts List				
Description	Qty	Part No.	Drawing no./name	
BearPaw Model BP130	1	112-0005-00	BearPaw BP130 Assembly	
BearPaw Pad	1	314-0024-01	BearPaw BP130 - Pad	
U Shaped Clips	2	314-0026-15	BearPaw BP130 - U Shaped Clips	
L Shaped Clips	2	314-0025-15	BearPaw BP130 - L Shaped Clips	
Slotted Clip Support	6	314-0007-15	BearPaw - Slotted Clip Support	
Filler blocks 3/32"	6	314-0015-01	BearPaw - Filler block 3/32" 1/8"	
Bolts	6	261-0001-17	Bolt- AN4-14	
Nuts	6	262-0001-17	Nut- MS20365-428	



Washers	12	263-0001-17	Washer - AN960-416
Shrink AB	23	314-0021-01	BearPaw - Shrink Specifications & Install.(1"x6.25")
IceBlade Option Model OIB	4	314-0005-15	VNR086 / IceBlade Assembly
Nuts	8	262-0001-17	Nut- MS20365-428
Washers	8	263-0001-17	Washer - AN960-416

#### INSPECTION

#### Life Limited Items

Three are no life limited items for the Helitowcart BearPaw.

#### **Pre-Flight**

Before each flight the following items should be inspected:

- · Check that attachment bolts are installed and secured,
- Check that BearPaws are free from visible damage.
- If damage is found, verify allowable damage according to: Table 5 – Tolerances for cracks & wear and Annex B – BearPaw BP130 Allowable Damage Drawing

#### **Periodic Inspection Schedule**

- The Helitowcart BearPaw shall be inspected every 500 flying hours or yearly whichever comes first.
- The Helitowcart BearPaw can be inspected concurrently with the helicopter landing gear inspection.
- Recommended tolerance for performance of inspection is +/- 10% of the 500 hours period.
- Following an inspection, subsequent interval shall be adjusted to meet the original schedule from time
  of inspection. If inspection is performed earlier than the 10% tolerance, then following inspections
  shall be scheduled not to exceed the above mentioned tolerance.

#### 500 Hour or Yearly Inspection Details

- Remove Helitowcart BearPaw: See Section "BearPaw Removal".
- Inspect all parts for damage & wear. See table & figure below for allowable damage,
- Replace all damaged parts.
- Replace parts worn beyond the tolerances indicated below.
- See Tolerances for cracks & wear:
   Table 5 Tolerances for cracks & wear, &
   Annex B BearPaw BP130 Allowable Damage Drawing

#### Table 5 - Tolerances for Cracks & Wear

Zone	Nominal Dimension (Inches)	Allowable Damage/Wear (Inches)	Cracks
Α	0,50	0,050	
В	1,000	0,250	
С	0,625	0,075	Stiffeners: NO cracks allow in the radius.
D	0,50	0,050	



E 0,05 (FWD) 0,050 Holes: NO cracks around
--------------------------------------------

#### **Overhaul Requirements**

· Not applicable for the designated application of this device.

#### **REVISIONS & APPROVAL**

#### Revisions

Date	Rev	Nature of Revisions
May 04,2006_ 2011	Α	Initial issue
NR		

#### Approval

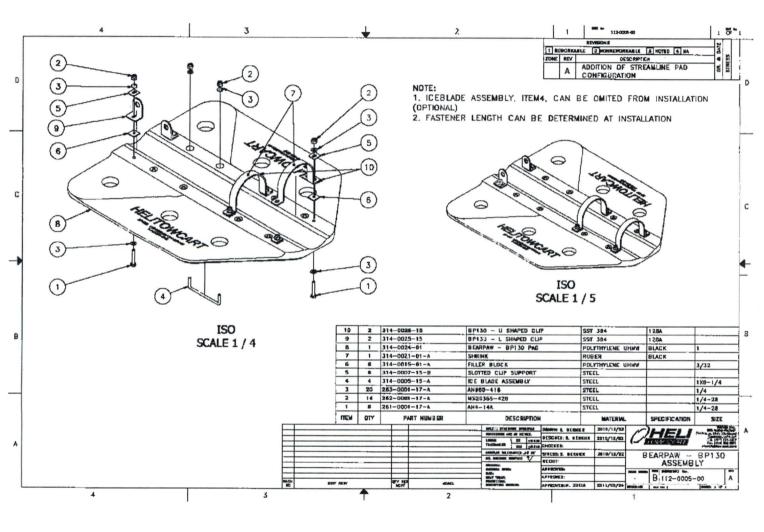
Internal Approval:		
Helitowcart inc.	Lucien Barbeau, President	Date:
External Approval :	120	<b>L</b>
Transport Canada	Not Typilat	Date:
	Mirko Zgela, DAR #3\0	May 4,2011



Annex A
BearPaw Assembly, Drawing no. (112-0005-00)

# Installation Instructions BearPaw Model BP130 EC130

314-0031-00-A



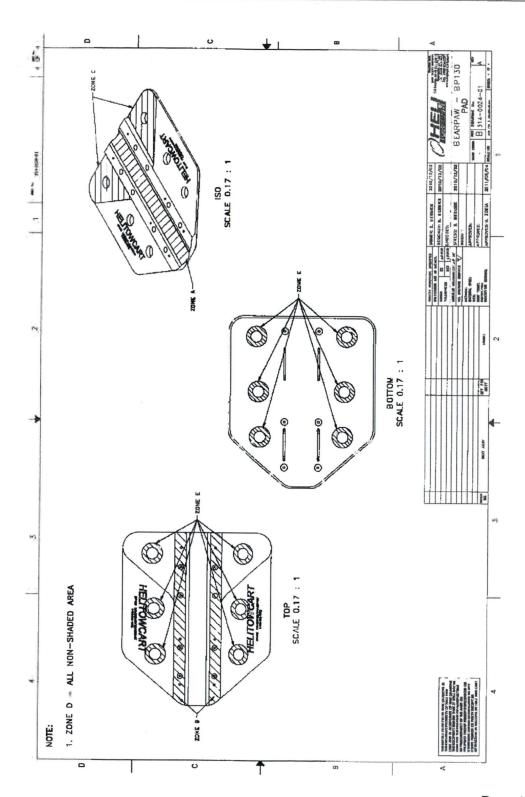
Page 9 of 11

Tel: 1-418-561-4512, Fax: 1-418-836-4575, 877A Alphonse-Desrochers, Saint-Nicolas, Levis, Québec, Canada G7A 5K6. www.helitowcart.com info@helitowcart.com



Annex B
BearPaw Pad, Drawing no. 314-0024-01 Page 4 of 4.





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#### Nathalie Barbeau

From:

Mirko Zgela [mirkoz@ats-ast.com]

Sent:

June-28-11 7:25 AM

To:

Nathalie Barbeau

Subject:

Draft STC - EC 130 BearPAw

Follow Up Flag: Follow up

Red

Flag Status: Attachments:

STC-Q-SH06-24\_Issue#3\_Draft.rtf

Le STC (darft) pour TCCA.

#### Salutations

Mirko Zgela M.Sc. MPM, CD

President

Aviatech Technical Services

Tel:

(819) 601-8049

Fax:

(819) 377-7928

Cell: (819) 383-7212

E-Mail: MirkoZ@ats-ast.com

Web: www.ats-ast.com

### **Department of Transport**

# Supplemental Type Certificate

This approval is issued to:

Number:

Q-SH06-24

Helitowcart 877A Alphonse-Desrochers St-Nicolas, Levis, (Québec)

Issue No.:

3 May 04, 2011

Approval Date: Issue Date:

May 25, 2011

Responsible Office:

Canada G7A 5K6

Quebec

Aircraft/Engine Type or Model:

See Continuation Sheet

Canadian Type Certificate or Equivalent:

See Continuation Sheet

Description of Type Design Change:

Installation of Helitowcart BearPaw

Installation/Operating Data, Required Equipment and Limitations:

Installation Data:

For the R44 Series:

Installation of is to be performed in accordance with TC approved Helitowcart Master Document List HTC-MDL-BP-R44-1000, Revision C dated April 15, 2010 or later Transport Canada approved revision.

The BearPaw must be installed in accordance with Helitowcart Installation Instructions document "314-0011-00-D, BearPaw Model BP44, Installation Instructions – R44" as specified by Helitowcart Inc. Master Document List HTC-MDL-BP-R44-1000.

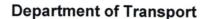
For the AS350 and AS355 Series:

Installation of is to be performed in accordance with TC approved Helitowcart Master Document List HTC-MDL-BP-AS350/355-1000, Revision F dated April 8, 2010 or later Transport Canada approved revision.

The BearPaw must be installed in accordance with Helitowcart Inc. Installation Instructions document "314-0020-00-E, BearPaw Model BP350, Installation Instructions – AS350/355" as specified by Helitowcart Master Document List HTC-MDL-BP-AS350/355-1000.

Conditions: This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated will not adversely affect the airworthiness of the modified product.

Jean Pierre Francoeur Aircraft Certification Engineer For Minister of Transport



# **Supplemental Type Certificate**

(Continuation Sheet)

For the EC130 Series:

Installation of is to be performed in accordance with TC approved Helitowcart Master Document List HTC-MDL-BP-EC130-1000, Revision A dated May 13, 2011 or later Transport Canada approved revision.

The BearPaw must be installed in accordance with Helitowcart Inc. Installation Instructions document "314-0031-00-A, BearPaw Model BP130, Installation Instructions – EC130" as specified by Helitowcart Master Document List HTC-MDL-BP-EC130-1000.

Limitations:

N/A

Required equipment:

N/A

Fleet Eligibility List					
Make	Model	Type Certificate Data Sheet			
Robinson	R44	H-97			
Robinson	R44 II	H-97			
Eurocopter	AS 350 D	H-83			
Eurocopter	AS 350 D1	H-83			
Eurocopter	AS 350 B	H-83			
Eurocopter	AS 350 B1	H-83			
Eurocopter	AS 350 B2	H-83			
Eurocopter	AS 350 B3	H-83			
Eurocopter	AS 350 BA	H-83			
Eurocopter	EC 130 B4	H-83			
Eurocopter	AS 355 E	H-87			
Eurocopter	AS 355 F	H-87			
Eurocopter	AS 355 F1	H-87			
Eurocopter	AS 355 F2	H-87			
Eurocopter	AS 355 N	H-87			

 End	

2

Q-SH06-24



# Master Document List

Eurocopter Model EC 130 B4 Helicopters Installation of BearPaw Model BP130

Report: HTC-MDL-BP-EC130-1000 (Rev A)

APPROVED BY:

Mirko Zgela /

Design Approval Representative DAR #310

E: \_\_\_\_\_ MAI 13, 2011



Revision	Revision Date	Revision of Entry	Entered by
Α	May 13, 2011	Initial issue	N/A



#### 1.0 MASTER DOCUMENTS

Document #	Title	Revision Status	Approval by	Date
AAC-CPL-BP- AS350/355/EC130-1000	Compliance Plan – Eurocopter Model AS350/355/EC130 Series Helicopters – Installation of BearPaw Model BP350 and BP130	В	DAR 310	May 11, 2011
ATS-1034-FTP-1000	EC130 B4 BearPaw Installation - Flight Test Plan	NC	DAR 310	Apr 14, 2011
ATS-1034-FTR-1000	EC130 B4 BearPaw Installation - Flight Test Report	NC	DAR 310	May 04, 2011
ATS-1034-STR-1000	Structural Substantiation – Helitowcart BearPaw Model BP130	NC	DAR 310	May 04, 2011
HTC-314-0031-00	BearPaw Model BP130 – Installation Instructions - EC130 B4 Helicopters	NC	DAR 310	May 04, 2011

#### 2.0 MASTER DRAWINGS

Drawings #	Title	Revision Status	Approval by	Date
VNR084	BearPaw - Iceblade	R01	DAR 310	Apr 24, 2006
VNR085	BearPaw – Iceblade Threaded Rod	R01	DAR 310	Apr 24, 2006
314-0005-15 (VNR086)	BearPaw - Iceblade Assembly	A (R01)	DAR 310	Apr 24, 2006
314-0007-15 (VNR089)	Bearpaw - Slotted Clip Support	B (R04)	DAR 310	July 31, 2006
314-0015-01	Filler Block 3/32" 1/8"	A	DAR 310	Aug 8, 2006
112-0005-00	BearPaw BP130 - Assembly	Α	DAR 310	May 04, 2011
314-0024-01	BearPaw - BP130 Pad	Α	DAR 310	May 04, 2011
314-0025-15	BP130 - L Shaped Clip	Α	DAR 310	May 04, 2011
314-0026-15	BP130 - U Shaped Clip	A	DAR 310	May 04, 2011



## 3.0 REFERENCE DOCUMENTS

Document #	Title	Revision Status	Approval by	Date
314-0009-01-A	Ultra High Molecular Weight Polyethylene - Typical Properties	Α	N/A	May 24, 2006
314-0008-01-A	Material Properties - UHMW TIVAR	Α	N/A	May 24, 2006
314-0017-05-A	Heat Shrink Specifications	Α	N/A	Sept 6, 2006

Bearpaws Parts List

			Quantities per PAIR		AIR
	Part Name	HTC P/N	BP44	BP350	BP130
PADS	Pad /BP44	314-0001-01	2		
	Pad /BP350	314-0018-01		2	
	Pad /BP130	314-0024-01			2
HARDWARE	Plastic bag 8x10	na	2	2	2
_	→ Rear Filler block/BP44	314-0022-01	2		
		×			
	U-Clip / BP44	314-0006-15	4		
	U-Clip / BP350	314-0019-15		6	
	U-Clip / BP130	314-0026-15			4
	► Low U-Clip/ BP44	314-0023-15	2		
SOURT I	Shrink on U-Clips	314-0021-01	6	6	6
	►L-Clip/BP130	314-0025-15			4
	▶Iceblade	263-0005-15	4	8	8
	─► Slotted clip support	314-0007-15	8	12	12
	Bolt - AN4-14A	261-0001-17		12	12
	Bolt - AN4-15A	261-0002-17	4	12	14
	Bolt - AN4-16A	261-0003-17	4		
	Nuts - MS20365-428				
	equiv: AN365-428A or MS21044N4	262-0001-17	20	28	28
	Washers - AN960-416	263-0001-17	40	40	40
	Filler block 1/4"	314-0012-01	4	12	
_	→ Filler block 3/32"	314-0014-01	4		
	Filler block 1/8"	314-0015-01	4		12
OCUMENTS	Plastic bag 9 x12	na	1	1	1
	Document - MDL/BP44	HTC-MDL-BP-R44-1000	1		
	Document - INST/BP44	314-0011-00	1		
	Document - MDL/BP350	HTC-MDL-BP-AS350-1000		1	
	Document - INST/BP350	314-0018-01-S		1	
	Document - MDL/BP130	HTC-MDL-BP-EC130-1000			1
	Document - INST/BP130	314-0031-00			1
	Can STC	na	1	1	1
	US STC	na	1	1	1
PACKAGING	Box / BP44 16.5x13x3.5"	na	1		
	Box / BP350 & BP130 24x21x3"	na		1	1
	Label /BP44	273-0001-04	1		
	Label /BP350 & BP130	273-0002-04		1	1

Nature of modifications: New format, added BP130

314-0010-00-i BearPaw Parts List (2011 05 27)





By Vanair

	<b>BP350</b>	<b>BearPaw</b>	(2)
--	--------------	----------------	-----

BP130 BearPaw (2)

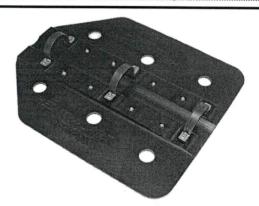
877A Alphonse-Desrochers, Saint-Nicholas, Levis, Quebec, Canada G7A 5K6 / Made in Canada

www.helitowcart.com

+1.418.561.4512

info@helitowcart.com

htc 273-0002-04-D





By Vanair

BP350 BearPaw (2)

BP130 BearPaw (2)

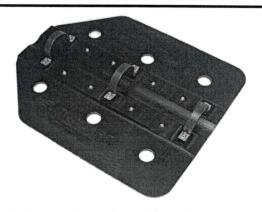
877A Alphonse-Desrochers, Saint-Nicholas, Levis, Quebec, Canada G7A 5K6 / Made in Canada

www.helitowcart.com

+1.418.561.4512

info@helitowcart.com

htc 273-0002-04-D





By Vanair

BP350 BearPaw (2)

BP130 BearPaw (2)

877A Alphonse-Desrochers, Saint-Nicholas, Levis, Quebec, Canada G7A 5K6 / Made in Canada

www.helitowcart.com

+1.418.561.4512

info@helitowcart.com

htc 273-0002-04-D

C:\Users\Thalie\Documents\001 BackUp Nathalie(2)\a HTC\d ENGINEERING & Proj Mngt\C BEARPAWS\273-0002-04-D-BearPaw LABEL Box(BP350 BP130)

N. Barla 2011 05 17

#### Nathalie Barbeau

From:

Simon Bernier [simonb@ats-ast.com]

Sent:

May-27-11 4:06 PM

To:

Nathalie Barbeau

Subject: Filler

les 1/8 c'est parfait.

Regards

Simon Bernier

Structure Specialist / Specialiste de Structure

E-Mail: simonb@ats-ast.com

Aviatech Services Techniques Inc. www.ats-ast.com

3005 rue Lindbergh, Trois-Rivières, Qc, G9A 5E1

Tel: (819)601-8049 (Ext:1106)

Fax:(819)377-7928

1/8 ) 00 . 3/32 ~

It détectivement de dossuis révisés:

ils out indiqué PH 314-0015.01 (= 18' filloublocar)

mais ont écrit 3/32'.

Après veuf Simon confirms: 1/8' est le bon

On s'entond que je vais annotes docs

manuellement et qu'il va fair modifi
lors d'un proclaime Me's car a servir

top lourd de changer le version pour

une tolle typo.



# Master Document List

## Eurocopter Model EC 130 B4 Helicopters Installation of BearPaw Model BP130

Report: HTC-MDL-BP-EC130-1000 (Rev A)

APPROVED BY: DATE: MAI 13, 2011

Mirko Zgela

Design Approval Representative DAR #310



Revision	Revision Date	Revision of Entry	Entered by
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AAC-CPL-BP- AS350/355/EC130-1000	Compliance Plan – Eurocopter Model AS350/355/EC130 Series Helicopters – Installation of BearPaw Model BP350 and BP130	В	DAR 310	May 11, 2011
ATS-1034-FTP-1000	EC130 B4 BearPaw Installation - Flight Test Plan	NC	DAR 310	Apr 14, 2011
ATS-1034-FTR-1000	EC130 B4 BearPaw Installation - Flight Test Report	NC	DAR 310	May 04, 2011
ATS-1034-STR-1000	Structural Substantiation – Helitowcart BearPaw Model BP130	NC	DAR 310	May 04, 2011
HTC-314-0031-00	BearPaw Model BP130 – Installation Instructions - EC130 B4 Helicopters	NC	DAR 310	May 04, 2011

#### 2.0 MASTER DRAWINGS

Drawings #	Title	Revision Status	Approval by	Date
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VNR085	BearPaw – Iceblade Threaded Rod	R01	DAR 310	Apr 24, 2006
314-0005-15 (VNR086)	BearPaw - Iceblade Assembly	A (R01)	DAR 310	Apr 24, 2006
314-0007-15 (VNR089)	Bearpaw - Slotted Clip Support	B (R04)	DAR 310	July 31, 2006
314-0015-01	Filler Block 3/32" 1/8"	Α	DAR 310	Aug 8, 2006
112-0005-00	BearPaw BP130 - Assembly	Α	DAR 310	May 04, 2011
314-0024-01	BearPaw - BP130 Pad	Α	DAR 310	May 04, 2011
314-0025-15	BP130 - L Shaped Clip	Α	DAR 310	May 04, 2011
314-0026-15	BP130 - U Shaped Clip	A	DAR 310	May 04, 2011



#### 3.0 REFERENCE DOCUMENTS

Document #	Title	Revision Status	Approval by	Date
314-0009-01-A	Ultra High Molecular Weight Polyethylene  - Typical Properties	Α	N/A	May 24, 2006
314-0008-01-A	Material Properties - UHMW TIVAR	Α	N/A	May 24, 2006
314-0017-05-A	Heat Shrink Specifications	Α	N/A	Sept 6, 2006



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#### INTRODUCTION

#### Scope

This installation instruction describes the step-by-step approach to install and to perform maintenance of the Helitowcart BearPaw Model BP 130 (P/N 112-0005-00) for the EC130-B4 helicopters.

#### General

The Helitowcart BearPaw is made of machined UHMW TIVAR® polymer sheet. This material combines high-impact performance, low friction and good resistance to chemical. Its high durability will provide superior performance when installed on your helicopter. Any question regarding the Helitowcart BearPaw system shall be directed to Helitowcart Customer Support as indicated in Table (1):

Table 1 - Helitowcart Customer Support

Care of	Mailing Address	Phone, Fax & Email:
Customer Support	877A Alphonse-Desrochers	Tel:1 (418) 561-4512
Helitowcart BearPaw	St-Nicholas, Levis, Quebec,	Fax:1 (418) 836-4575
Helitowcart (Vanair inc)	Canada, G7A 3K6	info@helitowcart.com

#### **Helicopter Effectivity**

This installation instruction applies to the following helicopter models:

Table 2 - Helicopter Model Effectivity

Make	Model	Transport Canada Type Certificate Data Sheet
Eurocopter	EC 130 B4	H-83

#### Installer Responsibilities

The installer shall ensure that the installation of the Helitowcart BearPaw does not conflict with any other part of the helicopter configuration. Technicians performing this installation should be familiar with A/C work and should have been familiarized with the different Helitowcart BearPaw system components prior to performing a first time installation. All steps in this procedure must be followed. Deviations from the procedures may result in potential structural failure or equipment malfunction and will result in a non-compliant installation.

#### INSTALLATION

#### **BearPaw Installation**

Reference Documentation:

[1] Helicopter Maintenance Manual EC130 as applicable.



#### Step 1: Helicopter Preparation

Ensure the helicopter is safe for maintenance:

 Lift the helicopter using the manufacturer recommended practice provided in Ref [1] as applicable to your helicopter model to allow a ground clearance of the skid in the area of the aft cross tube of approximately 1 ½" (38mm);

Remove Aft AN5 bolt;

Note: The BearPaw Model BP130 (P/N 112-0005-00) can be installed with or without the skid tube wear shoes.

#### Step 2: IceBlade Installation

Note: The BearPaw Model BP130 (P/N 112-0005-00) can be installed with or without the IceBlades

- With IceBlade Option
- Install ice blades (Qty: 4) (Iceblades P/N 314-0005-15) under BearPaw pad as per drawing (112-0005-00) provided at Annex A.
- Secure ice blades with washer (Washer P/N 263-0001-17) and nut (P/N 262-0001-17).

#### Step 3: BearPaw Installation

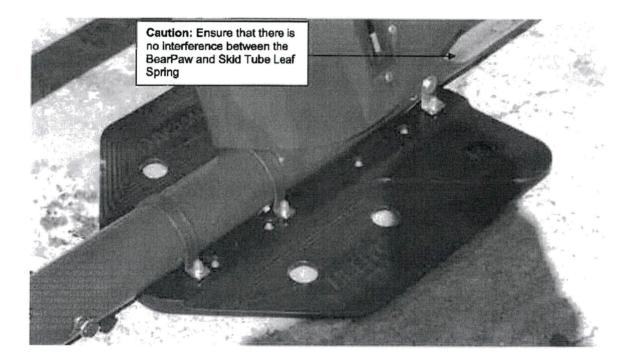
- Position the BearPaw under the skid as shown in Figure 1 with narrow edge pointing forward.
- Insert washers (P/N 263-0001-17) through all six bolts: 6x(261-0001-17);
- Insert bolts (P/N 261-0001-17) and washer (Washer P/N 263-0001-17) through BearPaw pad as per drawing (112-0005-00) provided at Annex A;
- Insert filler blocks (P/N314-0015-01) in the six bolts as per drawing (112-0002-00) provided at Annex A;

Note: The use of filler blocks (P/N314-0015-01) may be replaced or complemented by the use of washers (P/N 263-0001-17) to fill in the gap. Bolts (P/N 261-0001-17) may be replaced by longer or shorter AN4 bolts as required.

- Insert both U-shaped clips (P/N 314-0026-15) through forward bolts: 4x(261-0001-17);
- Insert both L-shaped clips (P/N 314-0025-15) through aftward bolts: 2x(261-0001-17);
- Insert slotted clip supports (P/N 314-0007-15) through all six bolts. Position slotted clip supports with rounded edge toward helicopter skid;
- Insert washer (P/N 263-0001-17) & screw nuts (P/N 262-0001-17) for a tight fit. Max. torque on nuts 60 in.-lb;
- Re-install removed AN-5 Bolt from step one;
- Remove helicopter from lift:
- Amend Weight & Balance records as required using data provided in Table 3.



Figure 1 - BearPaw Model BP130 (P/N 112-0005-00) - Alignment on Skid



#### BearPaw Removal

#### Step 1: Helicopter Preparation

- · Ensure the helicopter is safe for maintenance;
- Lift the helicopter using the manufacturer recommended practice provided in Ref [1] to allow a clearance of the skid in the area of the aft cross tube of approximately 1 ½" (38mm);

#### Step 2: BearPaw Removal

- Remove aftward AN5 bolt;
- Remove nuts (P/N 262-0001-17), slotted clip support (P/N 314-0007-15) on U-shaped clips (P/N 314-0026-15)2x and L-shaped clips (P/N 314-0025-15);
- Remove washers (P/N 263-0001-17), U-shaped clips (P/N 314-0019-15), L-shaped clips (P/N 314-0025-15), filler blocks (P/N314-0015-01) and remove BearPaw pad (P/N 314-0024-01);
- Inspect skid tubes to confirm serviceability;
- · Re-install aftward AN5 bolt:
- If the skid tube shoes have been removed, re-install shoes as per reference [1];
- Complete installation by putting helicopter back to normal position by removing lift status;
- Amend Weight & Balance records as required using data provided in Table 3.

#### Weight & Balance

The following information should be used to amend the helicopter weight and balance information following the installation or removal:

Table 3 - Weight & Balance Data

Item	Weight	Lateral		Longitudinal	
Tem	vveignt	Arm	Moment	Arm	Moment
Helitowcart BearPaw Model BP130 (P/N 112-0005-00)	20.0 Lb 9.1 Kg	N/A	N/A	182.2 in. 462.9 cm	3644.0 in-lb 42.12 m-kg

Note: Weight and moment provided are for full kit installation.

#### **Parts Lists**

The Helitowcart BearPaw detailed parts list is as follow:

Table 4 - Parts List

Table 4 Tales List					
Description	Qty	Part No.	Drawing no./name		
BearPaw Model BP130	1	112-0005-00	BearPaw BP130 Assembly		
BearPaw Pad	1	314-0024-01	BearPaw BP130 - Pad		
U Shaped Clips	2	314-0026-15	BearPaw BP130 - U Shaped Clips		
L Shaped Clips	2	314-0025-15	BearPaw BP130 - L Shaped Clips		
Slotted Clip Support	6	314-0007-15	BearPaw - Slotted Clip Support		
Filler blocks 3/32"/2"	6	314-0015-01	BearPaw - Filler block 3/32" 1/8"		
Bolts	6	261-0001-17	Bolt- AN4-14		
Nuts	6	262-0001-17	Nut- MS20365-428		

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Washers	12	263-0001-17	Washer - AN960-416
Shrink	28	314-0021-01	BearPaw - Shrink Specifications & Install.(1"x6.25")
IceBlade Option Model OIB	4	314-0005-15	VNR086 / IceBlade Assembly
Nuts	8	262-0001-17	Nut- MS20365-428
Washers	8	263-0001-17	Washer - AN960-416

#### INSPECTION

#### Life Limited Items

Three are no life limited items for the Helitowcart BearPaw.

#### Pre-Flight

Before each flight the following items should be inspected:

- Check that attachment bolts are installed and secured.
- Check that BearPaws are free from visible damage.
- If damage is found, verify allowable damage according to:
   Table 5 Tolerances for cracks & wear and
   Annex B BearPaw BP130 Allowable Damage Drawing

#### **Periodic Inspection Schedule**

- The Helitowcart BearPaw shall be inspected every 500 flying hours or yearly whichever comes first.
- The Helitowcart BearPaw can be inspected concurrently with the helicopter landing gear inspection.
- Recommended tolerance for performance of inspection is +/- 10% of the 500 hours period.
- Following an inspection, subsequent interval shall be adjusted to meet the original schedule from time
  of inspection. If inspection is performed earlier than the 10% tolerance, then following inspections
  shall be scheduled not to exceed the above mentioned tolerance.

#### 500 Hour or Yearly Inspection Details

- Remove Helitowcart BearPaw: See Section "BearPaw Removal".
- Inspect all parts for damage & wear. See table & figure below for allowable damage.
- Replace all damaged parts.
- Replace parts worn beyond the tolerances indicated below.
- See Tolerances for cracks & wear:
   Table 5 Tolerances for cracks & wear, &
   Annex B BearPaw BP130 Allowable Damage Drawing

#### Table 5 - Tolerances for Cracks & Wear

Zone	Nominal Dimension (Inches)	Allowable Damage/Wear (Inches)	Cracks
A	0,50	0,050	
В	1,000	0,250	
С	0,625	0,075	Stiffeners: NO cracks allow in the radius.
D	0,50	0,050	



E	0,05 (FWD) 0.625 (AFT)	0,050 0,075	Holes: NO cracks around the holes.	
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#### **Overhaul Requirements**

· Not applicable for the designated application of this device.

#### **REVISIONS & APPROVAL**

#### Revisions

Date	Rev	Nature of Revisions
May 04,2006 201/	Α	Initial issue

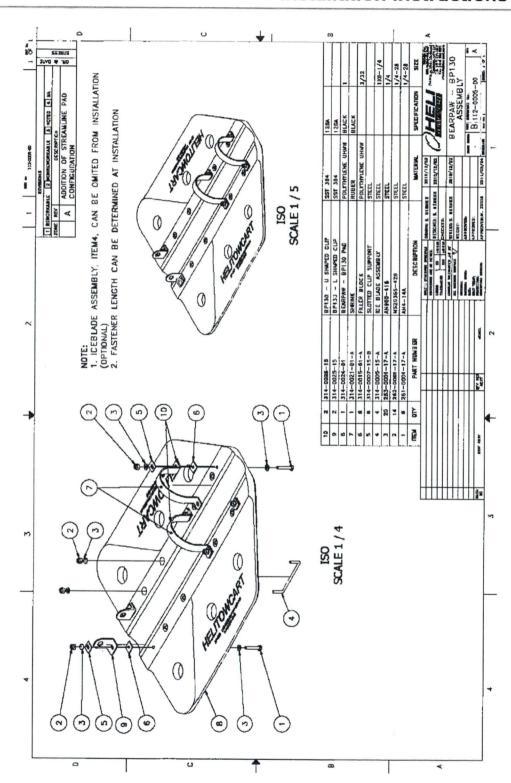
#### **Approval**

Internal Approval		
Helitowcart inc.	Lucien Barbeau, President	Date:
External Approval:	120	- L
Transport Canada	Mirko Zgela, DAR #310	Date: May 4, 2011



Annex A

BearPaw Assembly, Drawing no. (112-0005-00)

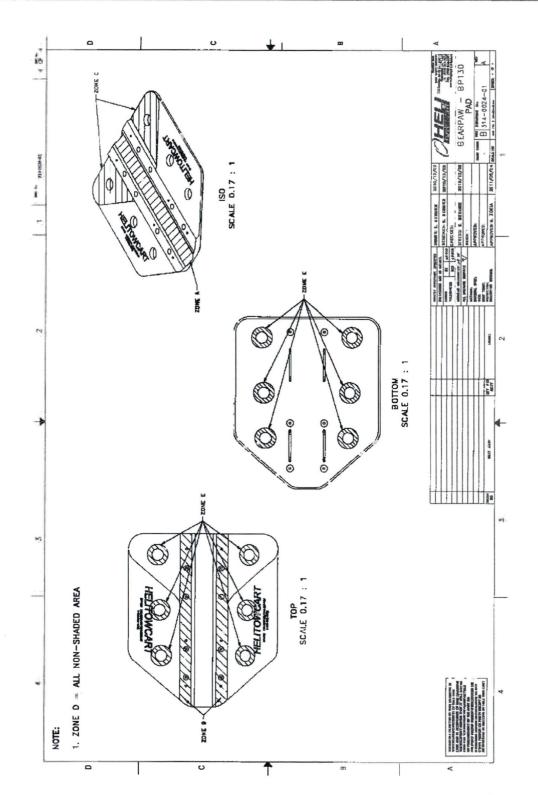


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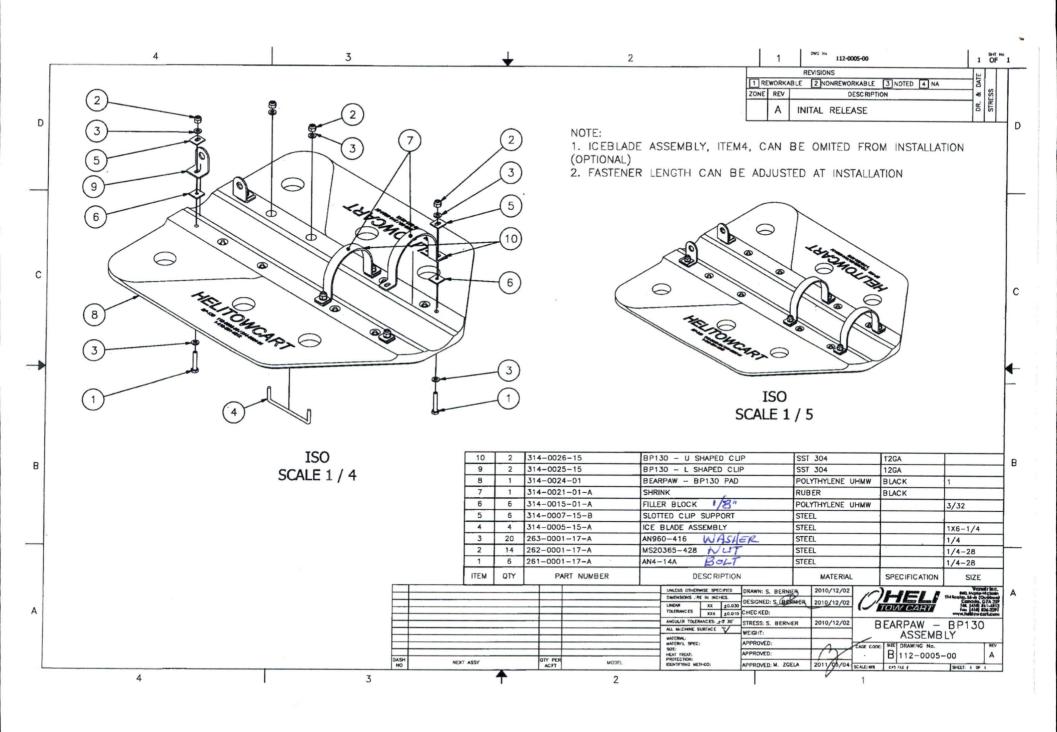
Annex B
BearPaw Pad, Drawing no. 314-0024-01 Page 4 of 4.

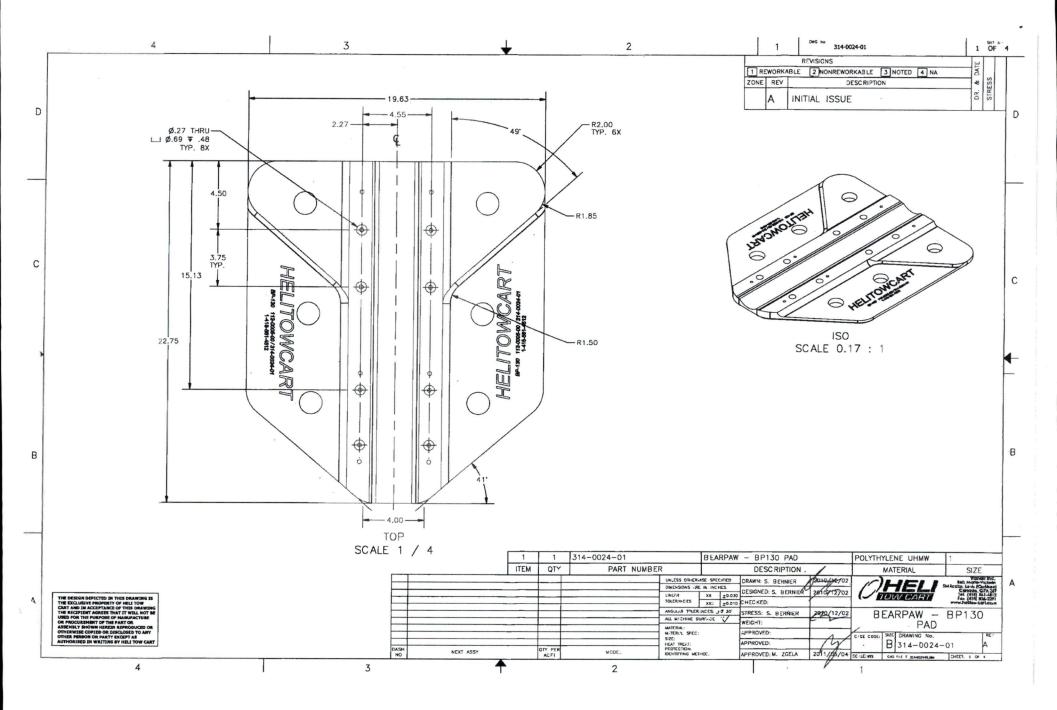


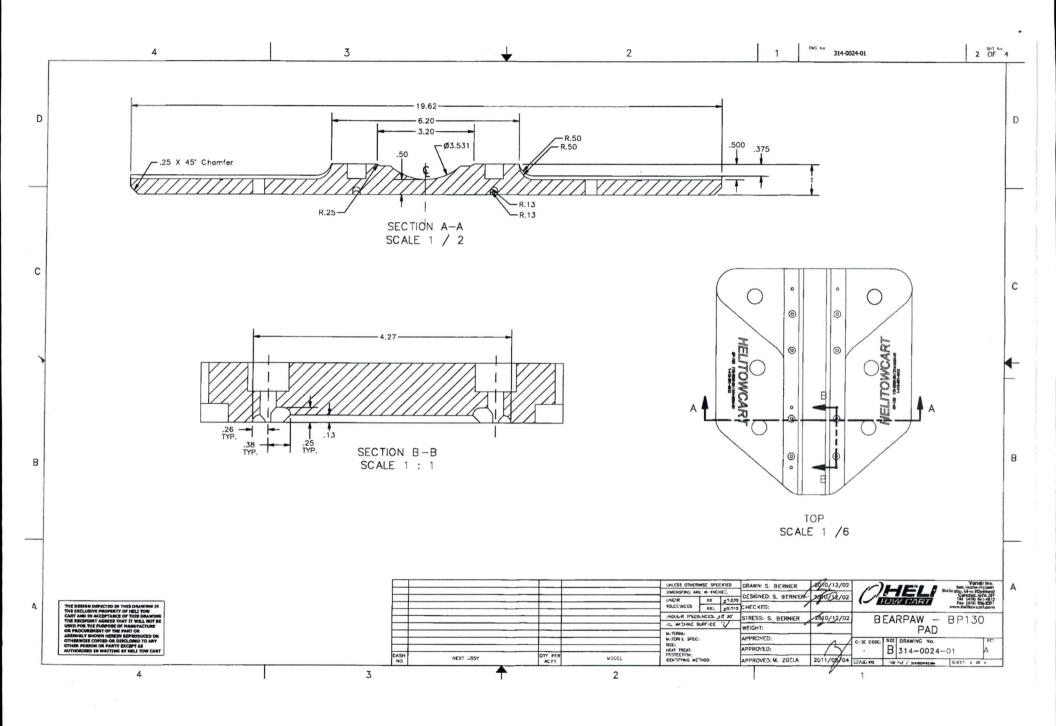


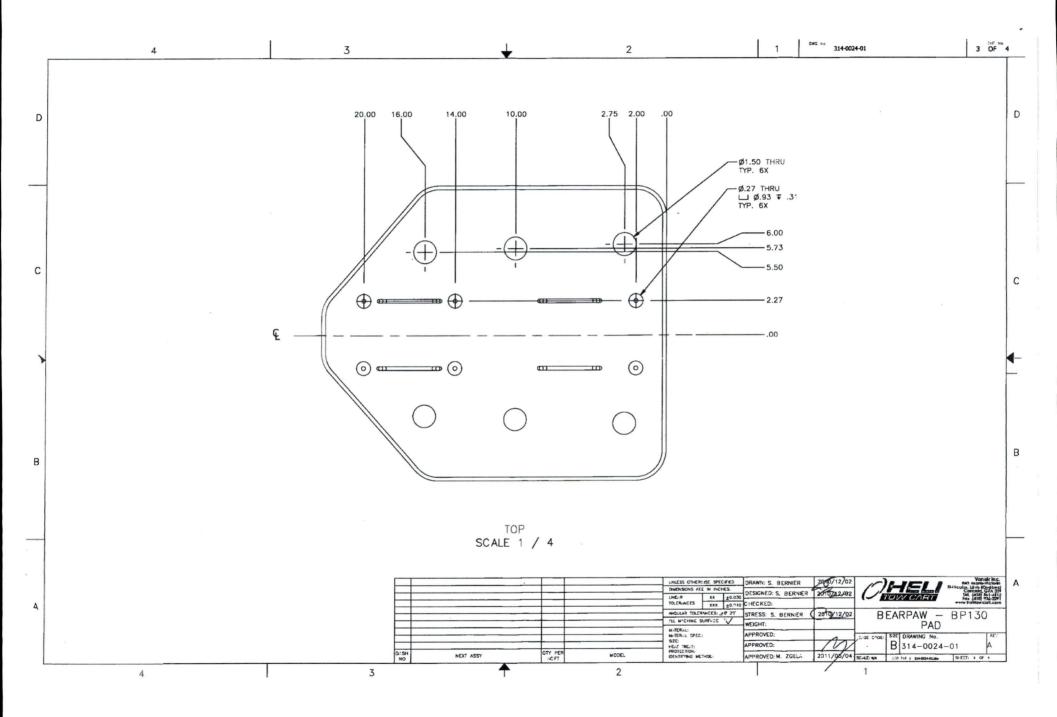
Page 11 of 11

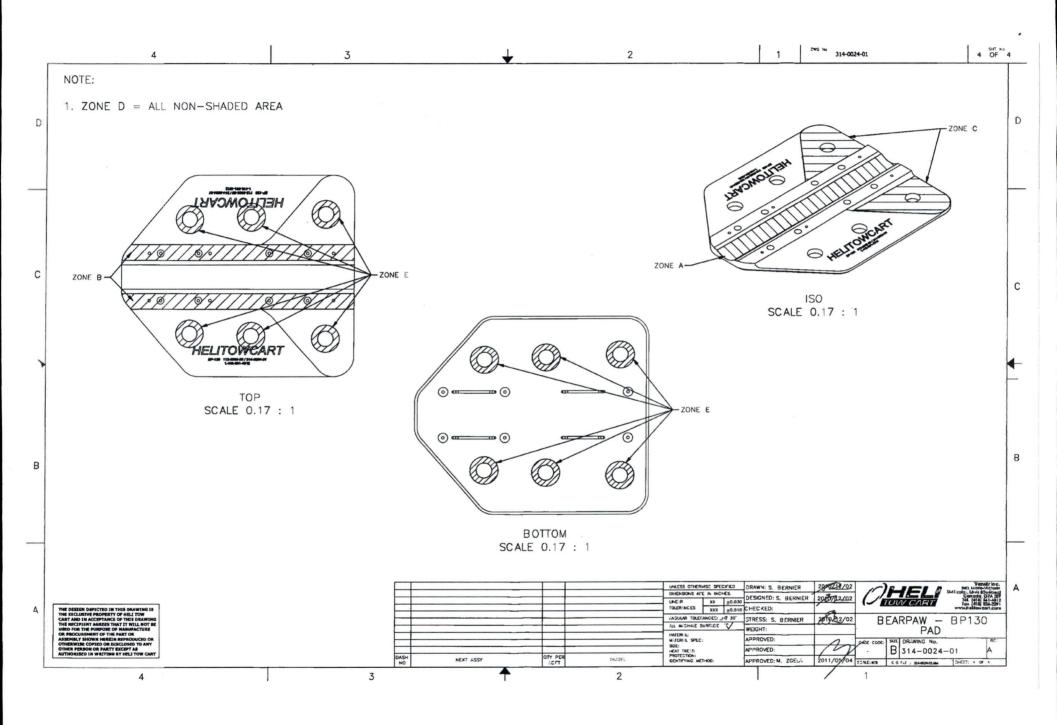
Tel: 1-418-561-4512, Fax: 1-418-836-4575, 877A Alphonse-Desrochers, Saint-Nicolas, Levis, Québec, Canada G7A 5K6. <a href="mailto:www.helitowcart.com">www.helitowcart.com</a> <a href="mailto:linfo@helitowcart.com">linfo@helitowcart.com</a>

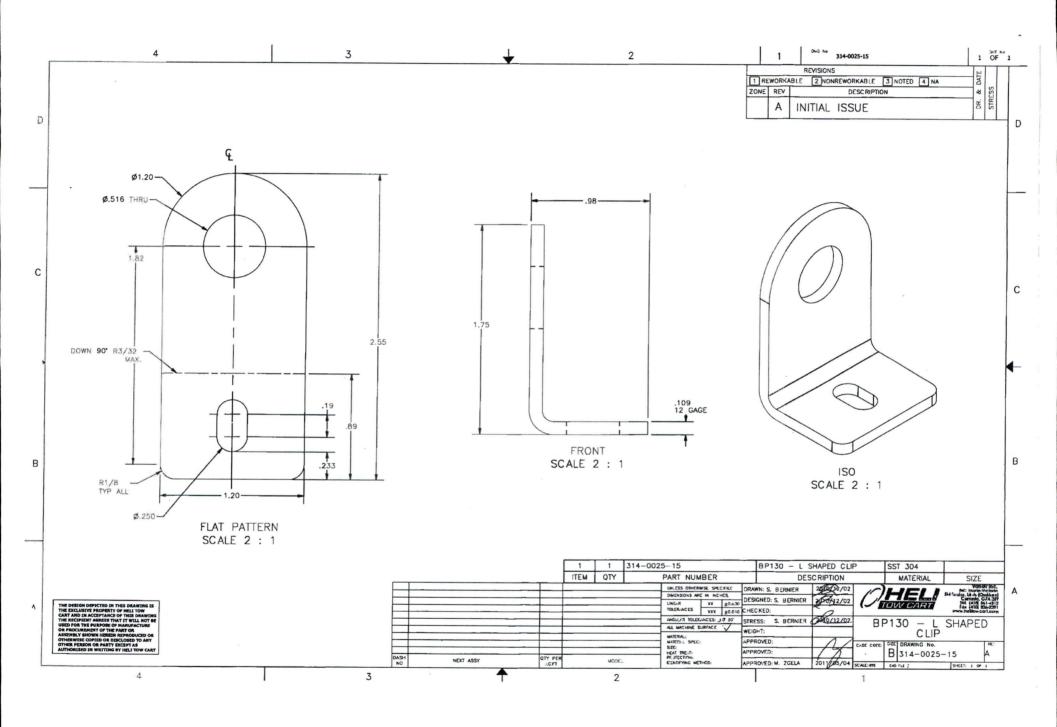


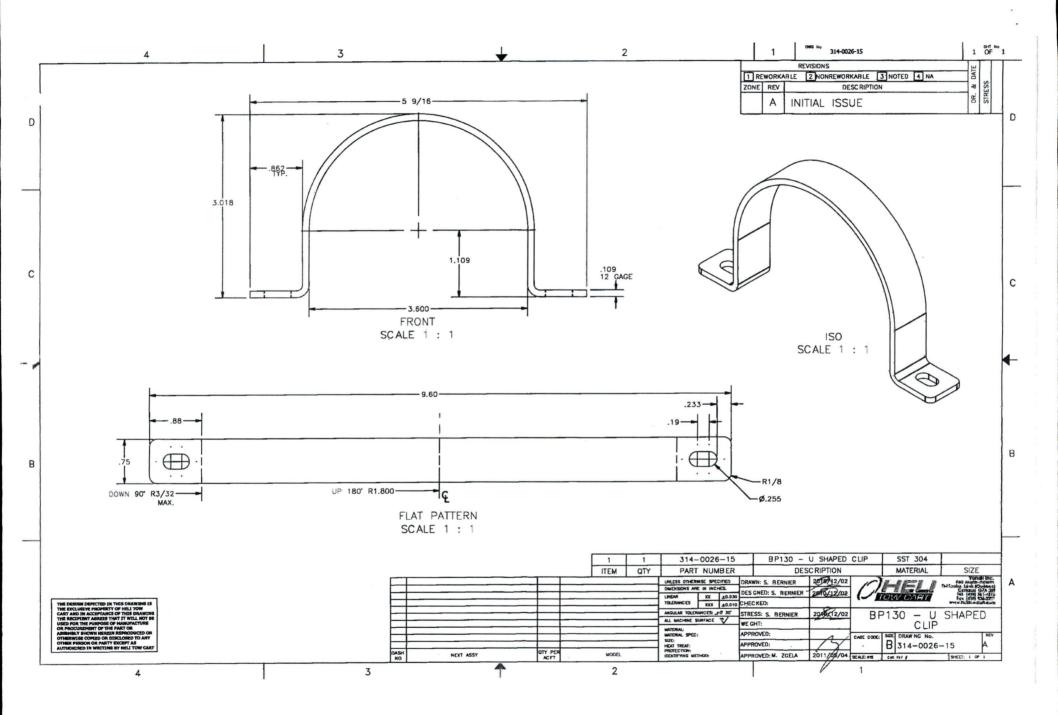












# Nathalie Barbeau

From: Mirko Zgela [mirkoz@ats-ast.com]

Sent: May-13-11 11:33 AM
To: Nathalie Barbeau

Subject: Bear Paw Ec 130 B4

Nathalie, Lucien, c'est un GO pour la production des BearPaws pour el EC130. Il n'y a aucun problème envisagé avec l'approbation.

#### Salutations

Mirko Zgela M.Sc. MPM, CD

President

Aviatech Technical Services

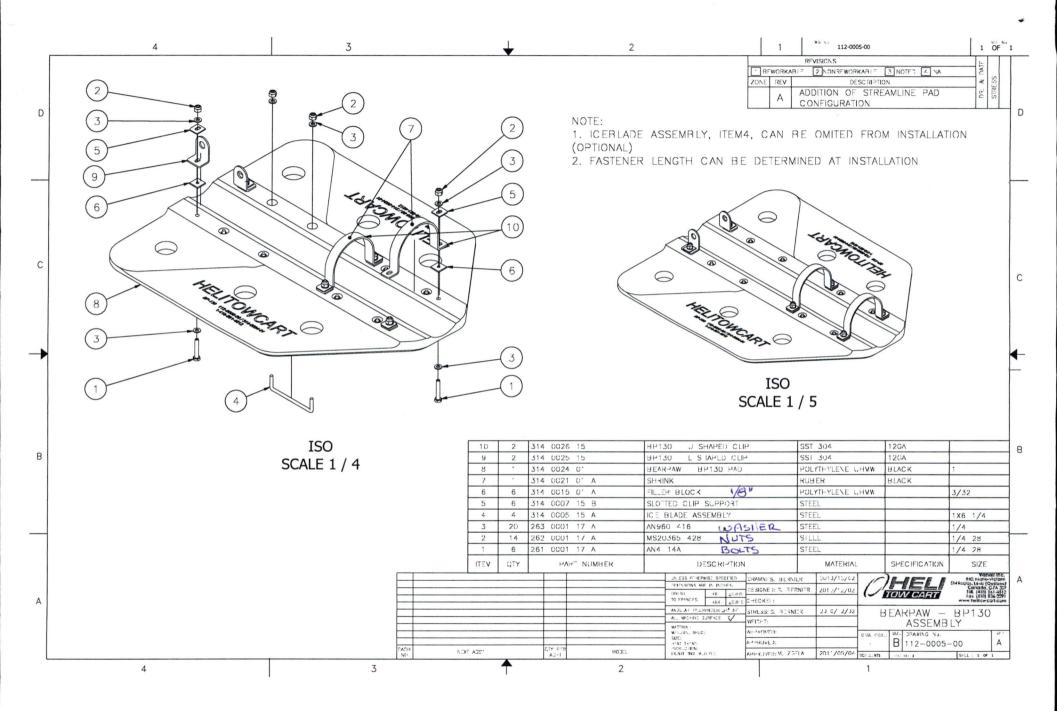
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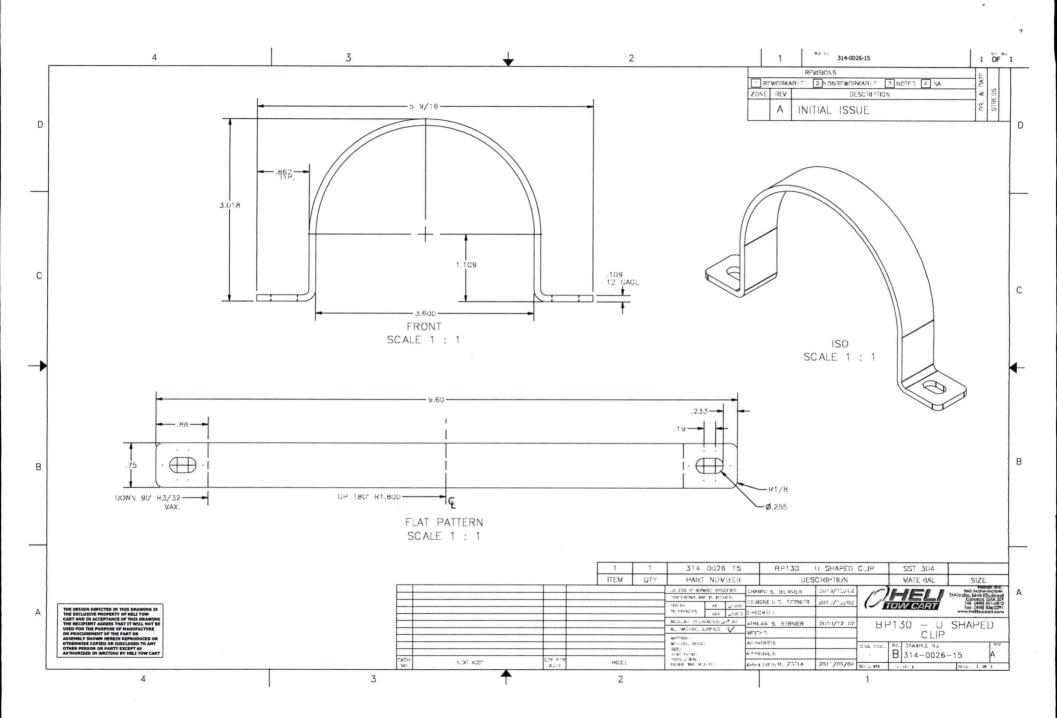
E-Mail: MirkoZ@ats-ast.com Web: www.ats-ast.com

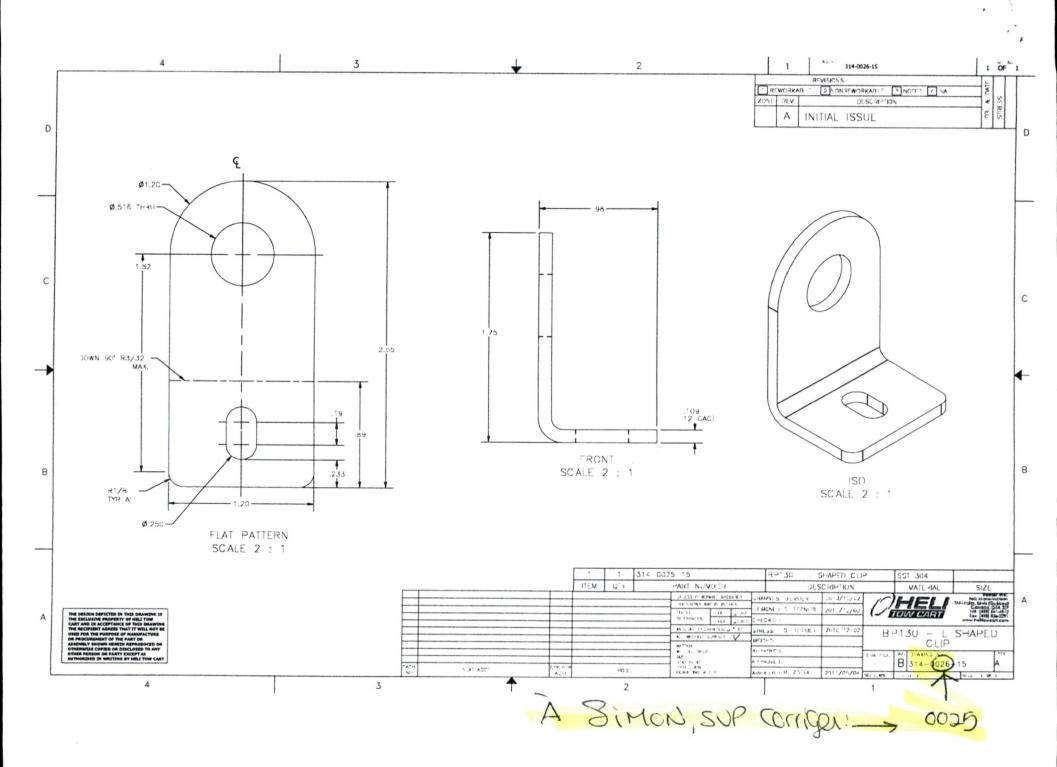
1) PADS

2)

3)







# BP130 PRICE PLAN

Cost: \$579 (pad ± 212#) \$3275 - 206 D \$ 2620

Foer in 70 profit que BP350 prix doit she \$2232. t: 418 831 3882

# TCCA – Simple External Modification EC130 B4 BearPaw Installation - Flight Test Plan

Aircraft Type: Eurocopter EC	130 B4	Registration / Ser No	C-FXSH / 4968		
Modification Description: Inst	Description: Installation of Helitowcart BearPaw as per STC: SH06-24 Issue #3				
Modification Drawing Number: Installation conforms to:		: HTC-MDL-BP-EC13	0-10000 Rev NC		
		d as per: HTC-314-0031-00-A, "BearPaw Model BP130 – – EC130 Helicopter", Rev A.			
Date of Flight:		Location of Flight:	CYQB – Capital Helicopter Inc.		
Test Weight:		Test CG:			
Configuration (List All External Mods): Configuration #1		1: Clean helicopter (Baseline)			
Configuration #2: BearPaw installed as per HTC-314-0020-00-A, HTC 00-A, "BearPaw Model BP130 – Installation Instructions – EC130 He A.					
Note: Two flights will be required	, one clean to be used as b	paseline the other with	the BearPaw installed.		

# TEST RESULTS

Test	Characteristics to Look For	Initial if Satisfactory
527.171 – Stability General	Perform at least three take/landing from a soft soils/snow to ensure that the bear paw does not create any abnormal conditions.	
527.309 – Design Limitation (c) & (d) 527.143 – Controllability and Maneuverability	Perform forward rearward and sideward flight (left & right) at maximum speed. Note the following:  - Abnormal vibration of the airframe/Landing gear  - Abnormal vibration of BearPaw  - Large displacements of BearPaw/Landing gear  - Controllability of the helicopter	
527.251 - Vibration	Perform forward rearward and sideward flight (left & right) at maximum speed. Note the following:  - Abnormal vibration of the airframe/landing gear  - Abnormal vibration of BearPaw  - Large displacements of BearPaw/Landing Gear  - Controllability of the helicopter	

527.173 Static Longitudinal Stability 527. 175 Demonstration of Static Longitudinal Stability – (Cruise)

Cruise: 30	UUF	T	Al	
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Set power to achieve a trim condition at 0.9Vh. Note the following:

Rotor RPM:	
Q:	
N1:	
N2:	

The collective stick should be fixed in that position; usually by applying sufficient friction to ensure that it is not inadvertently moved. Increased or decreased in about 10-knot increments, stabilizing on each speed and recording the longitudinal cyclic position, then decreasing speed through the same altitude band.

Speed	Speed (IAS)	Cyclic Position (1)
+10		
+10		
+10		
Vh		
-10		
-10		
-10		

Cyclic position from reference at (Vh).

Can trim conditions can be easily achieved.

Climb: 2500 Ft PAlt

Set power to achieve a trim condition at 0.9Vh. Note the following:

Rotor RPM:	
Q:	
N1:	
N2.	

The collective stick should be fixed in that position; usually by applying sufficient friction to ensure that it is not inadvertently moved. Decrease climb speed in about 10-knot increments, stabilizing on each speed and recording the longitudinal cyclic position, then decreasing speed through the same altitude band. Target alt 3000 ft.

Speed	Speed (IAS)	Cyclic Position (1)	Climb Rate
Vh			
-10			
-10			
-10			

Cyclic position from reference at (Vh).

Can trim conditions in climb can be easily achieved.				
Autorotati				
Set power	to achieve a trim	condition at 0.9Vh. Note	e the following:	
Ŋ	Rotor RPM: 2: V1: V2:			
Initiate an autorotation increased or decreased autorotation speed in about 10-knot increments, stabilizing on each speed and recording the longitudinal cyclic position, then decreasing speed through the same altitude band. Target alt 3000 ft.				
Speed	Speed (IAS)	Cyclic Position (1)	Decent Rate	
+10				
+10				
Vh				
-10				
-10				
	tion from reference	ce at (Vh).		

527.177 Static Directional	The state of the s				
Stability	Climb:				
	With MCP (Maximum Continuous Power) established, initiate a climb at 70 KIAS.  Apply L/H and R/H rudder input to approximately 10 deg sideslip. The helicopter directional stability must be positive steadily increasing directional control input for increasing angles of sideslip.  Repeat the above maneuver at 10 KIAS increment up to 95 KIAS.				
	Cruise:				
	With the point to approximate stability mu	proximately 10 deg sid	t 60 KIAS. Apply L/H a deslip. The helicopter d r increasing directional	irectional	
	Speed	Speed (IAS)	Sideslip positive re	turn	
	60				
	+10				
	+10				
	+10				
	+10				
	+10				
	+10				
		abnormal vibrations.  abnormal degradatio	on in directional stability	y.	
527.629 - Flutter 527.143 – Controllability and Maneuverability	Perform a shallow dive at 1.1 VNE. Note the following  - Abnormal vibration of the airframe, landing gear and rotor blade  - Abnormal vibration of BearPaw/Landing Gear  - Large displacements of BearPaw  - Controllability of the helicopter				
I hereby attest that I have flown (the above modification(s) installe when the modified with the above	d and that this	s aircraft exhibited the			
Pilot I/C Signature:			D	ate:	
Pilot's Name:			Pilot's License	No:	
If applicable - DAR's Signature	DAR's /No:				

Date: Tue, 15 Mar 2011 02:18:19 +0000 [14/03/11 10:18:19 PM EDT]

From: motorcarlease@hotmail.com

To: info@helitowcart.com

Subject: Re: Helitowcart Mail- Repair

**51**45618676

Thnxs, sorry for the late email, I waz just reminded of the problem by Starlink

----Original Message-----From: info@helitowcart.com To: motorcarlease@hotmail.com Subject: Re: Helitowcart Mail- Repair Sent: Mar 14, 2011 10:12 PM

I will speak with Lucien first thing in the morning. Please remind us What is your phone number so that Lucien can reach you.

Ms Nathalie Barbeau VP Commercial Affairs

Helitowcart (Vanair inc.) 877a Alphonse-Desrochers St-Nicolas, Qc, Canada, G7A 5K6 Tel: +1.418.561.4512 Fax: +1.418.836.4575 email: info@helitowcart.com www.helitowcart.com

Quoting motorcarlease@hotmail.com:

Hello Natalie

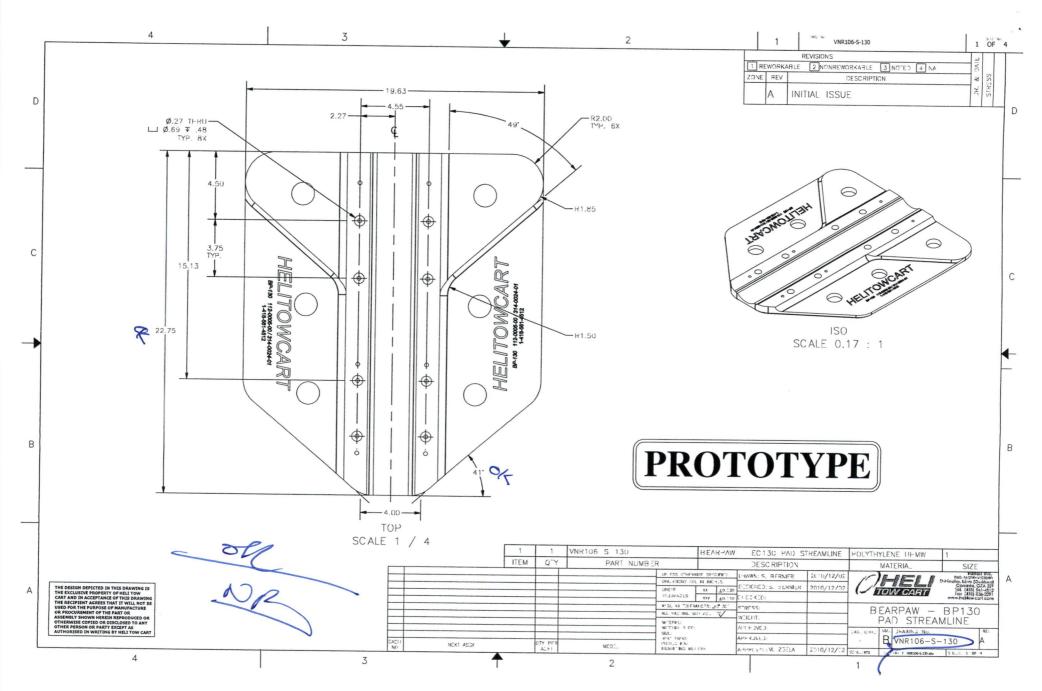
Its Dean, we bought a 4 wheel drive cart from you over this winter, it has stopped working showing full charge but not all 4 wheels are turning and its moving slowly. How do we proceed in gettin this problem resolved? Let me know Dean Sent from my BlackBerry® smartphone

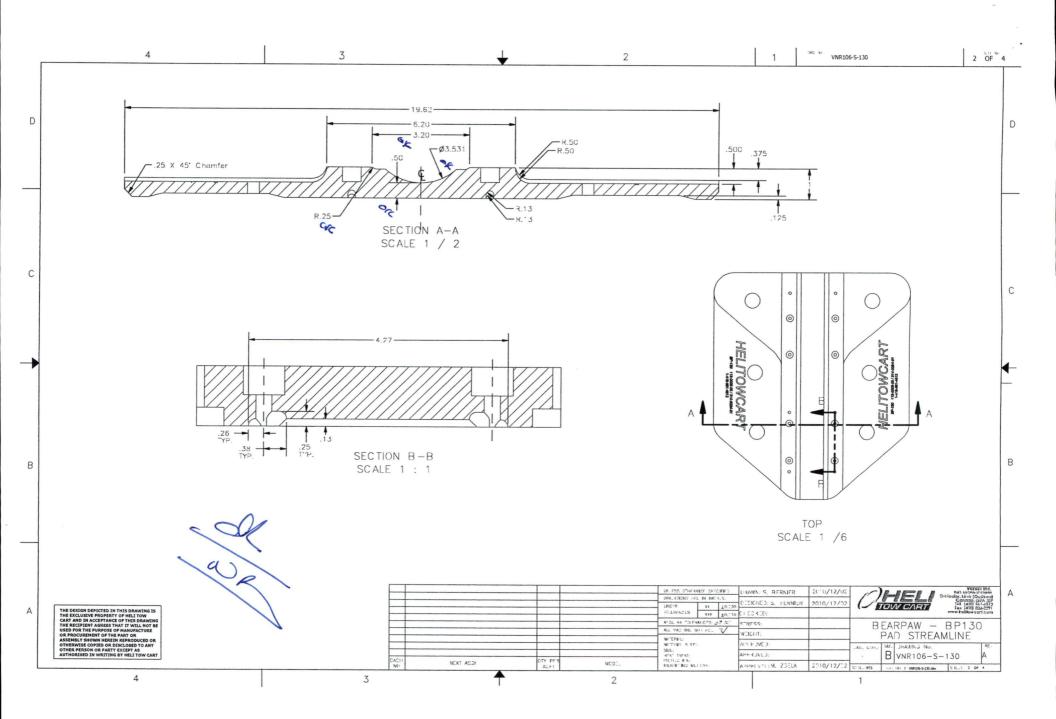
Sent from my BlackBerry® smartphone

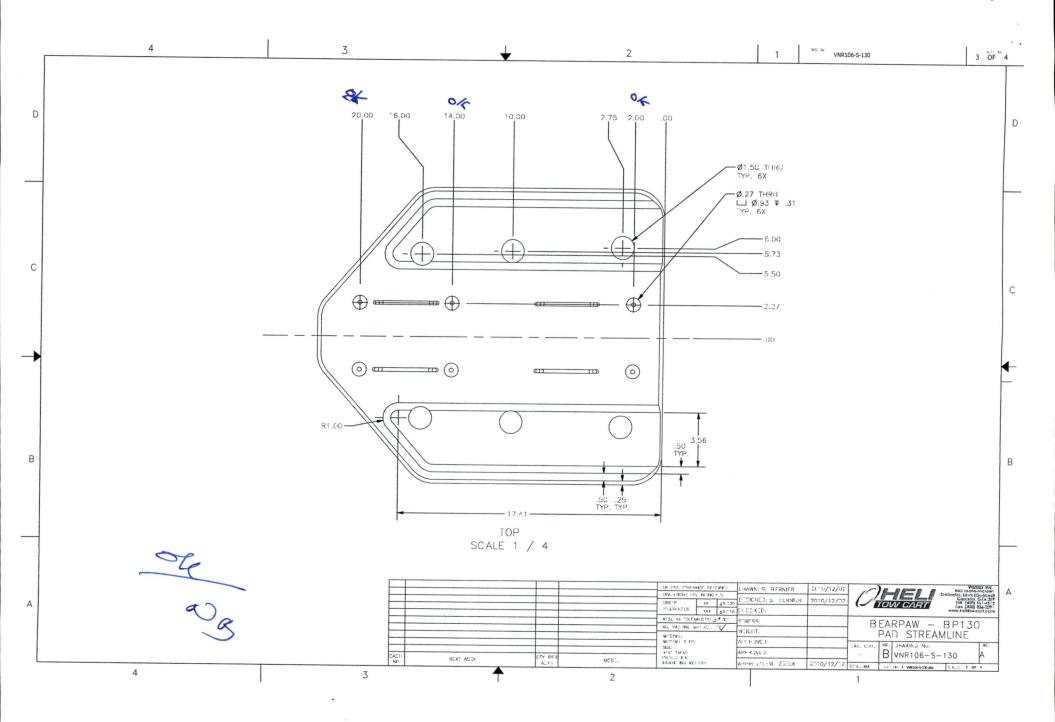


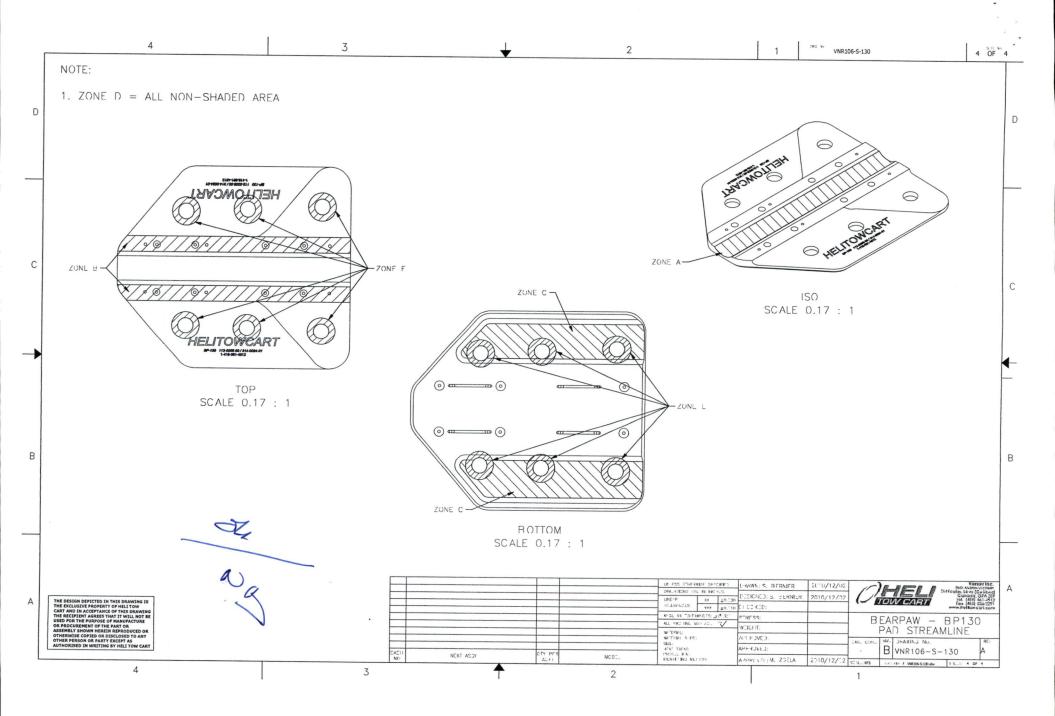


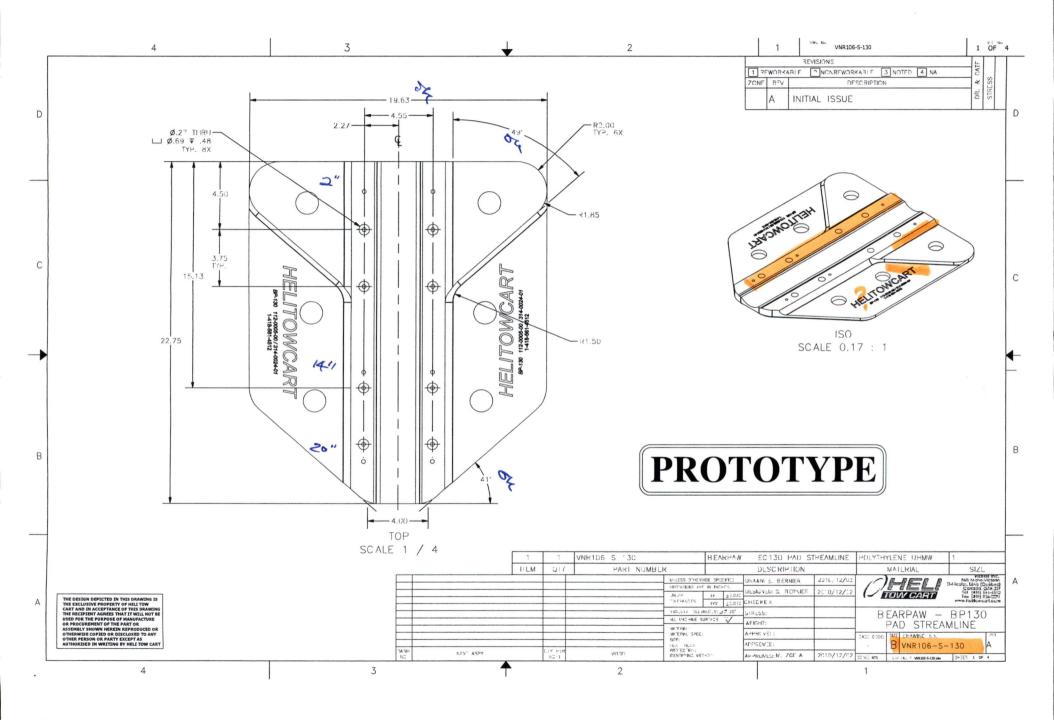
# **FAX TRANSMISSION**

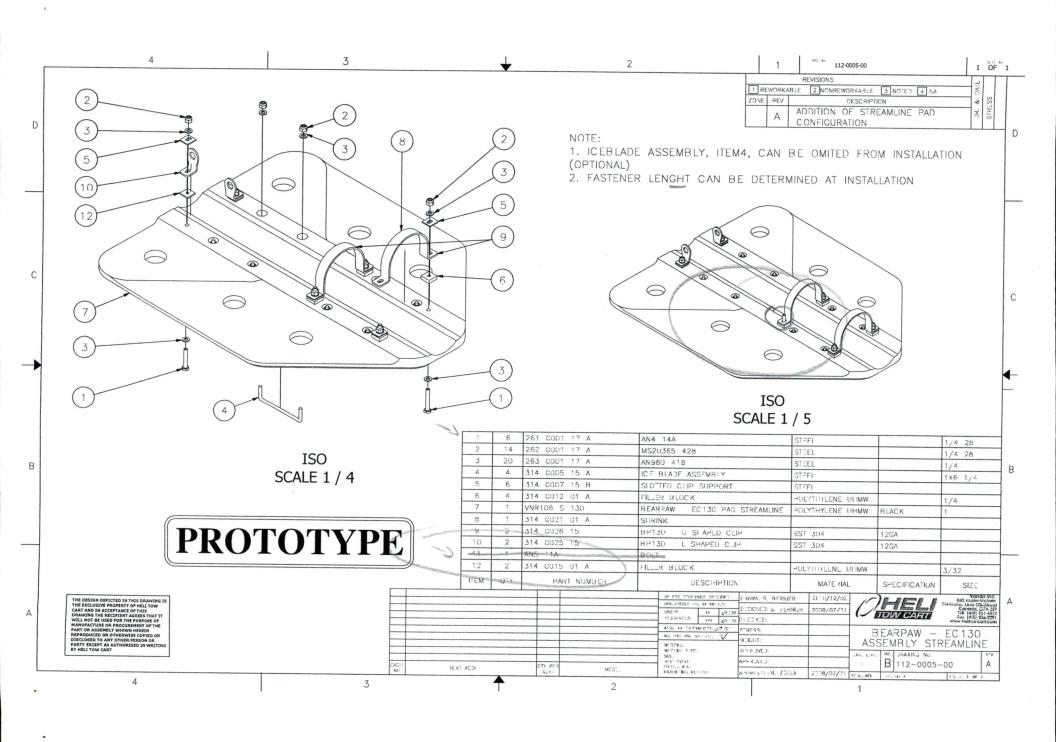


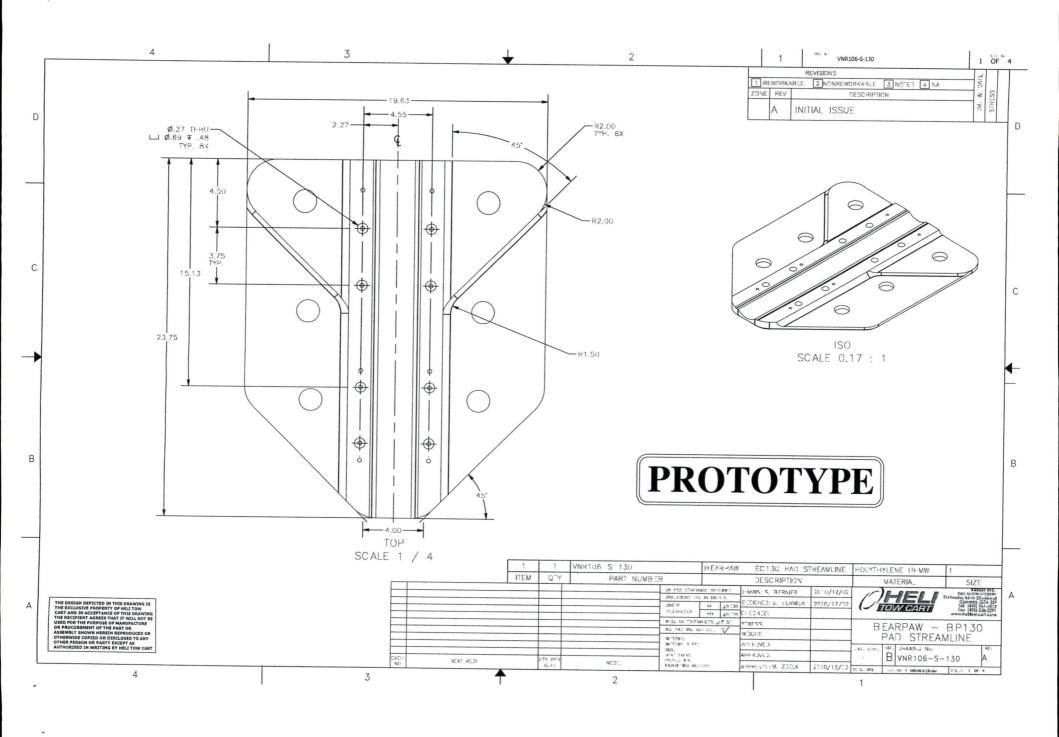


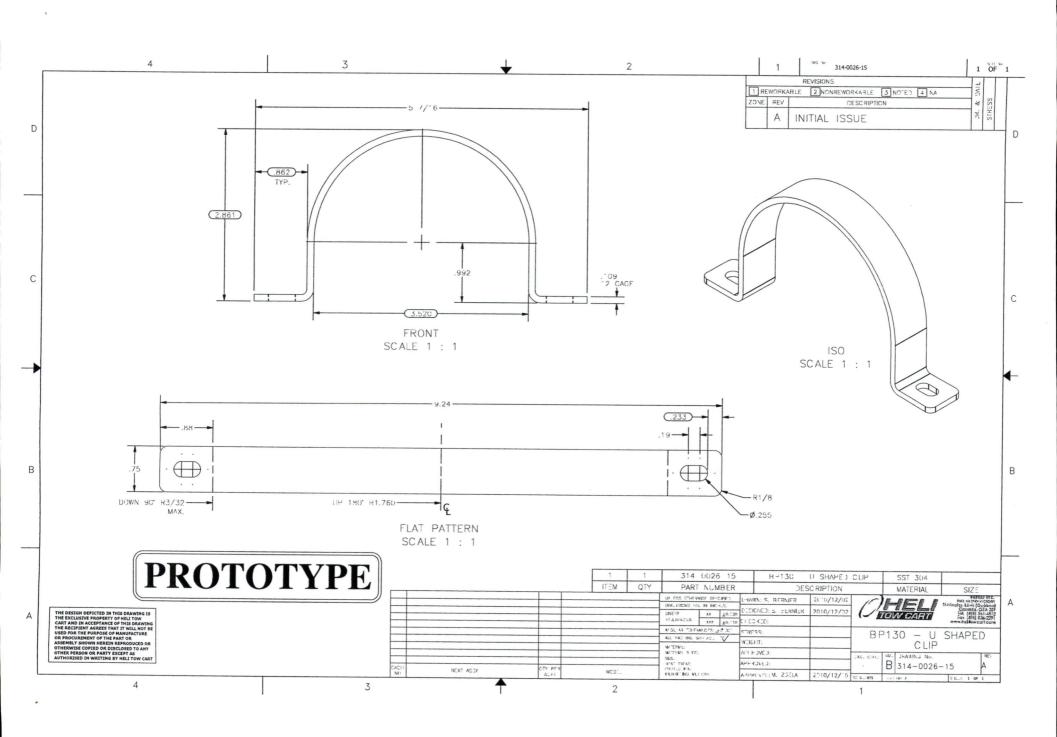


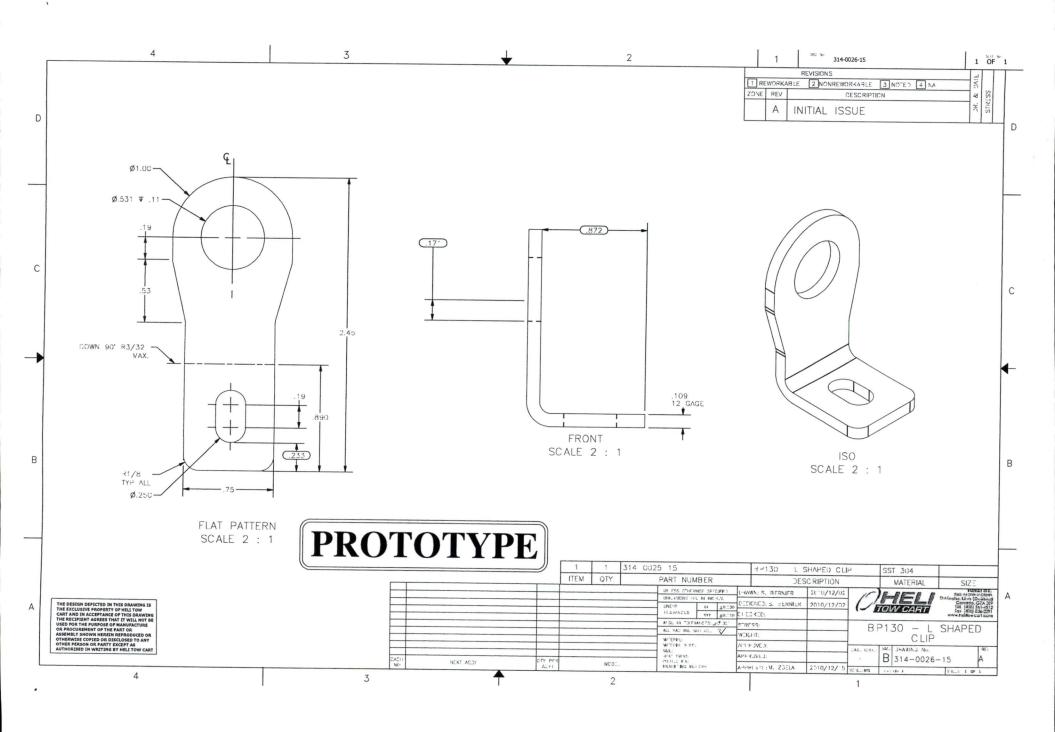


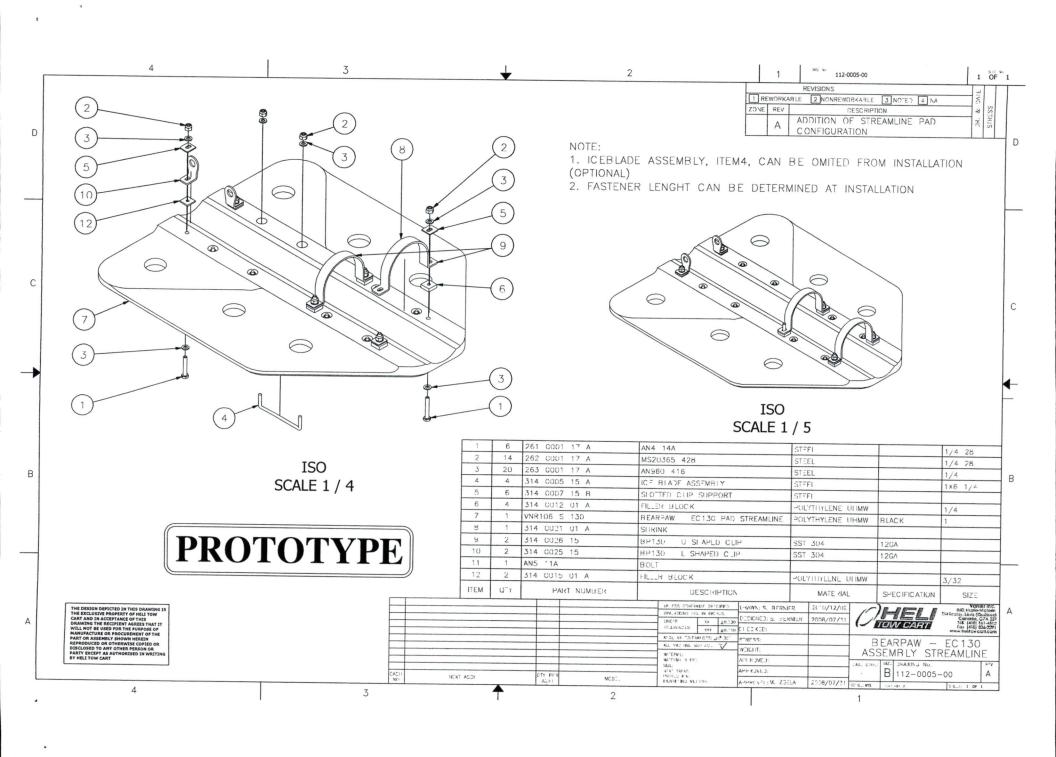


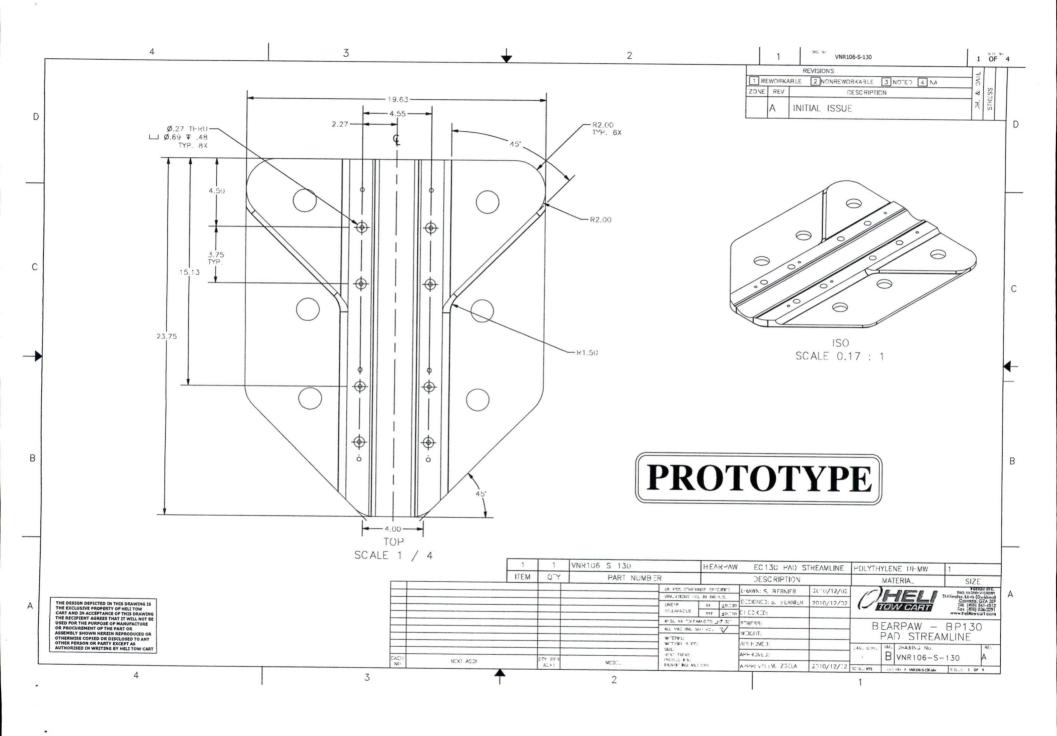


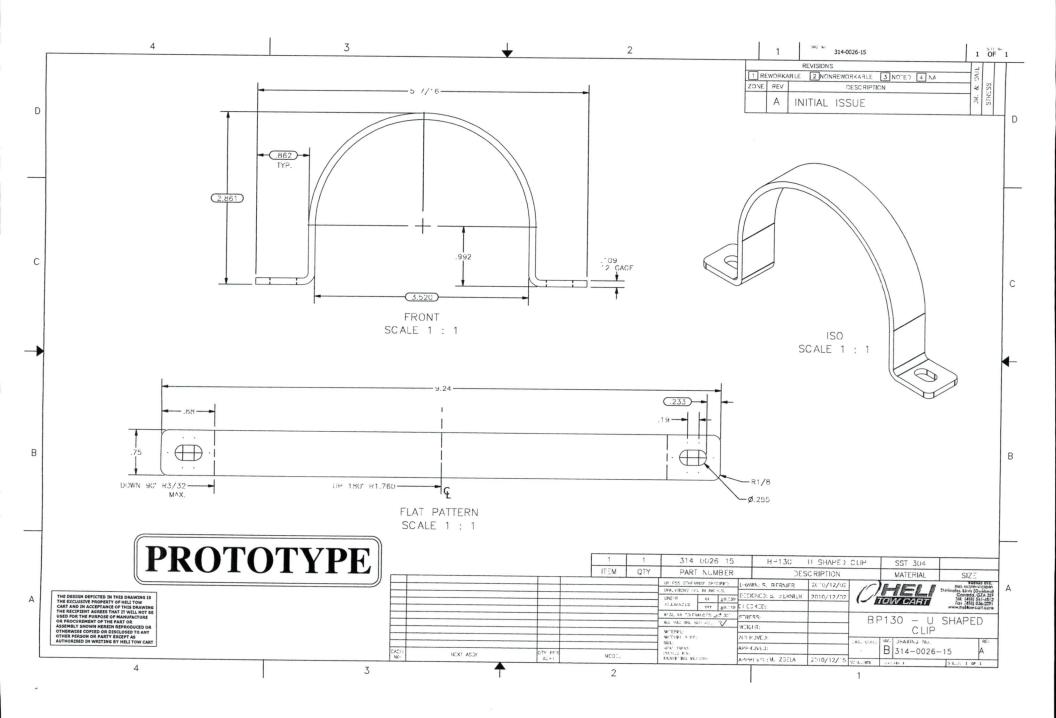


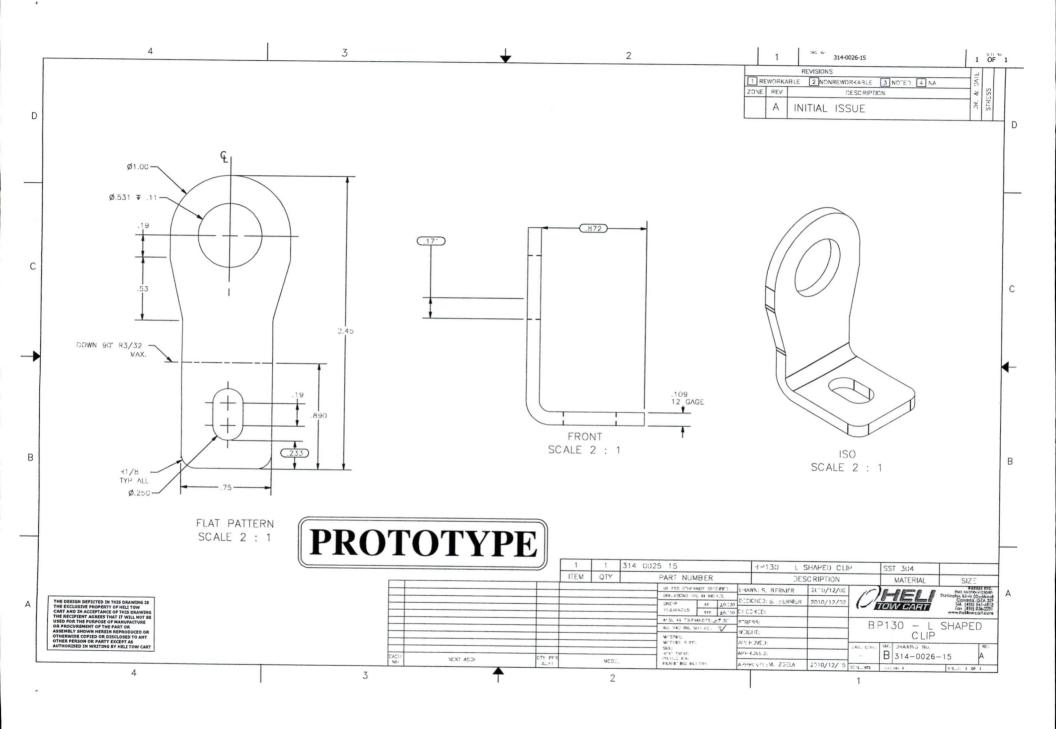


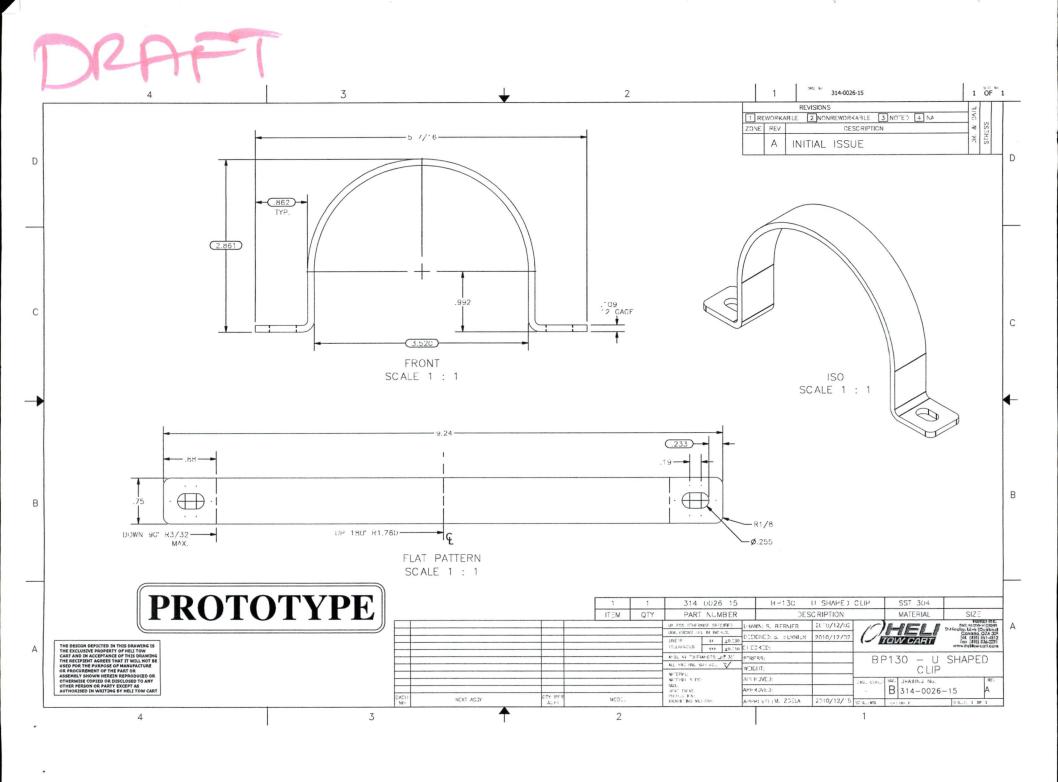


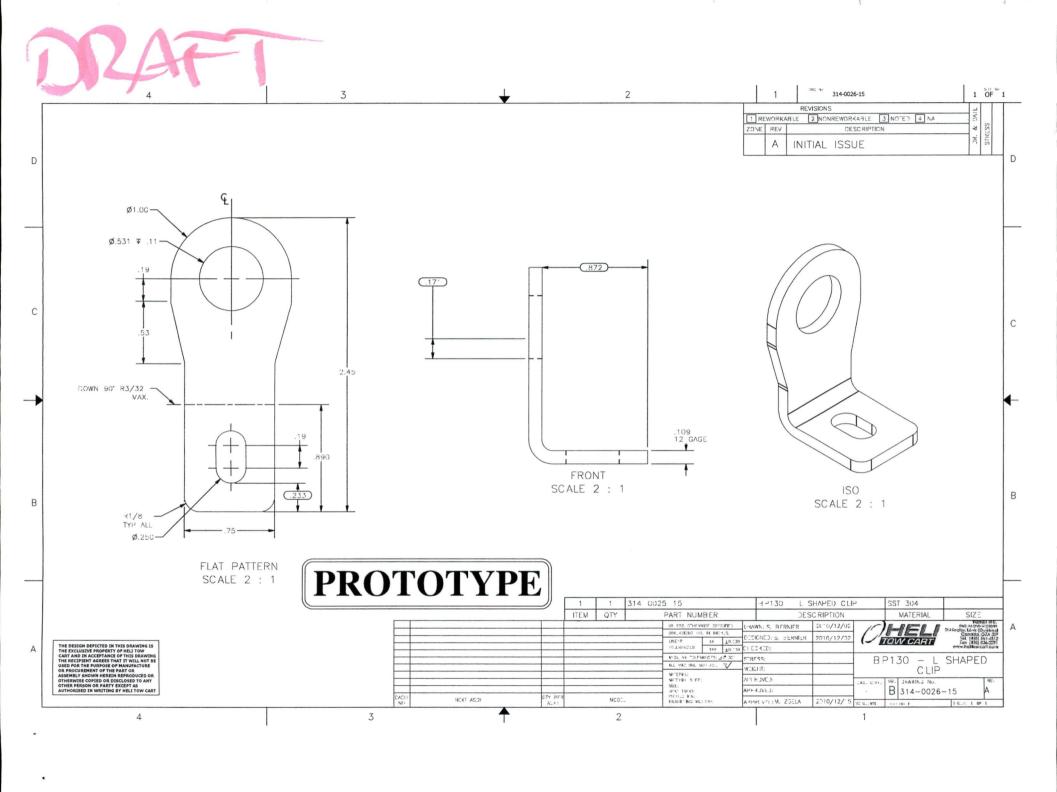


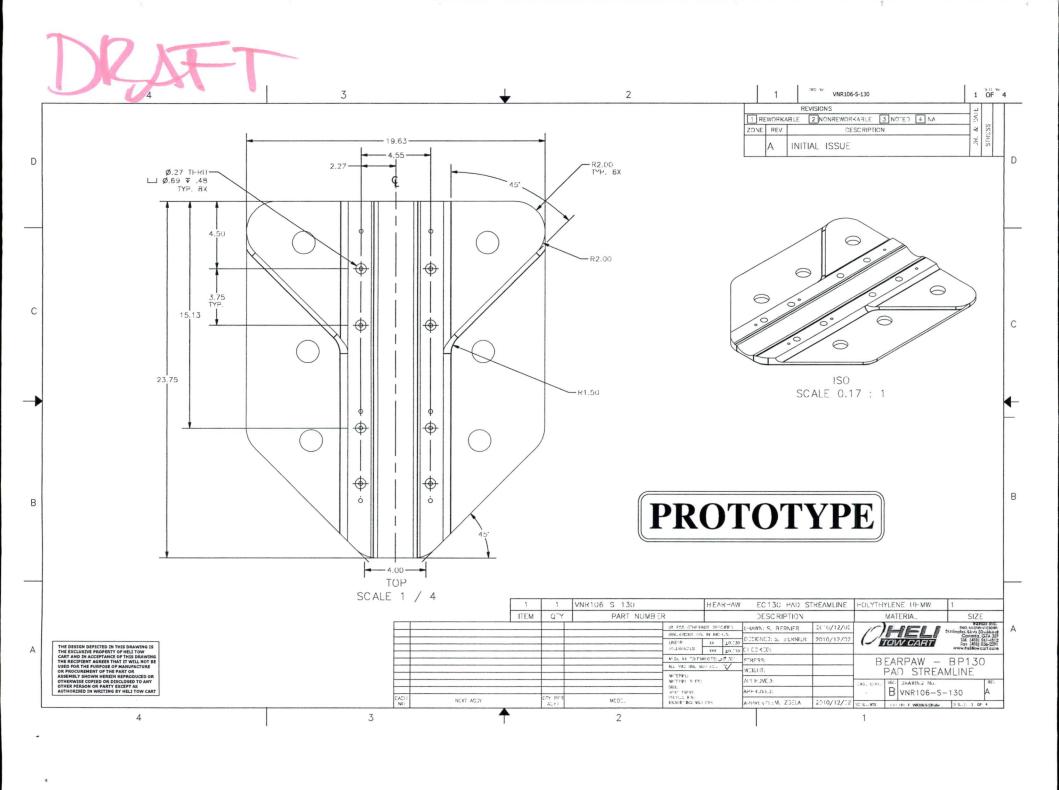


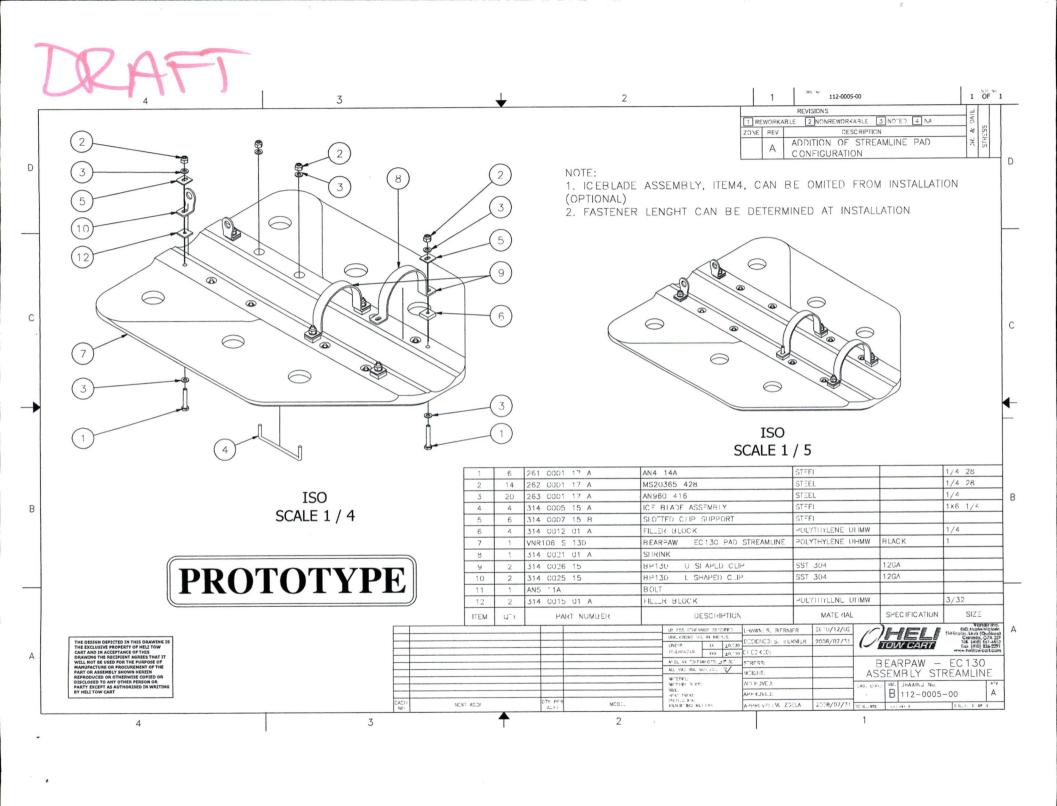












nence de foir proto ie 3600 elapement rescessaire avont



#### Nathalie Barbeau

From: Simon Bernier [simonb@ats-ast.com]

Sent: January-07-11 11:31 AM

To: Nathalie Barbeau

Subject: EC130 Salut Nathalie -

Je te répond a toi et a Lucien en retard, car j'était absent du bureau.

Bon oui avec ce que tu ma donné je pourrai terminé mes dessins en début de semaine prochaine.

Et nous serons prêts pour le prototypage et ainsi faire les flight tests.

La documentation serait finalisé après les flight tests

Voici deux soumissions (non-officiel) si nous ferions le prototype

Fabrication prototype:

2x BP130 Pad

1x Développement pour fabrication de prototype

3600\$ + EXTEA + AU\$ 5000

Production de 40 unités BP130 1x BP130 Pad 210\$ ch

Regards

Simon Bernier

Structure Specialist / Specialiste de Structure

E-Mail: simonb@ats-ast.com

Aviatech Services Techniques Inc. www.ats-ast.com

3005 rue Lindbergh, Trois-Rivières, Qc, G9A 5E1

Tel: (819)601-8049 (Ext:1106)

Fax:(819)377-7928

De: Nathalie Barbeau [mailto:nbarbeau@helitowcart.com]

Envoyé: 2011/01/04 16:44

A: Simon Bernier

Cc: info@helitowcart.com

Objet: Enfin! La dimension! Taille du boulon sur skid de EC1309

Simon

J'étais dans l'erreur: Lucien est allé déjà prendre la mesure Voici: 1/2" de diamètre du corps du boulon, tête du boulon 3/4"

Est-ce ok? Nathalie

From: Simon Bernier [mailto:simonb@ats-ast.com]

Sent: January-04-11 3:25 PM

To: Nathalie Barbeau

Subject: RE: Taille du boulon sur skid de EC1309

Bonne Année Nathalie -

As-tu pu avoir le diamètre du boulon? C'est tout ce qui me manque pour finir le design des braquettes

Merci

Regards

Simon Bernier

Structure Specialist / Specialiste de Structure

E-Mail: simonb@ats-ast.com

Aviatech Services Techniques Inc. www.ats-ast.com

3005 rue Lindbergh, Trois-Rivières, Qc, G9A 5E1

10/01/2011

Tel: (819)601-8049 (Ext :1106)

Fax:(819)377-7928

**De:** Nathalie Barbeau [mailto:nbarbeau@helitowcart.com]

Envoyé: 2010/12/23 17:31

À : Simon Bernier

Cc: lbarbeau@sympatico.ca

Objet: Taille du boulon sur skid de EC1309

Simon, Je viens de voir quel boulon to cherche. Je ne sais pas... c'est un boulon qui vient avec l'hélico. Laisse moi demander à Lucien d'obtenir cette info à l'aéroport. Je te reviens, Nathalie

From: Simon Bernier [mailto:simonb@ats-ast.com]

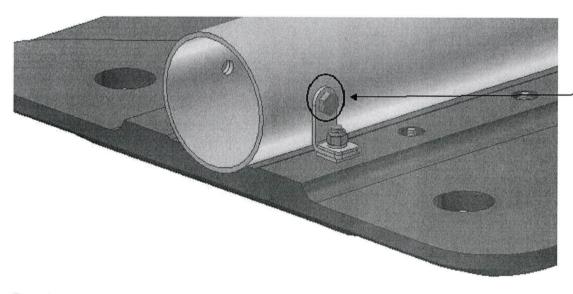
Sent: December-22-10 4:28 PM

**To:** Nathalie Barbeau **Subject:** Bearpaw

Salut Nathalie -

j'aurais besoin que tu me confirme le diamètre de la Bolt arrière du skid.

Joyeux Noel. Moi je suis en vacance du 23 Dec au 3 Janv.



#### Regards

Simon Bernier

Structure Specialist / Specialiste de Structure

E-Mail: simonb@ats-ast.com

Aviatech Services Techniques Inc. www.ats-ast.com

3005 rue Lindbergh, Trois-Rivières, Qc, G9A 5E1

Tel: (819)601-8049 (Ext:1106)

Fax:(819)377-7928

FOEI 0106

(Jeen model de 1940 comme de 26/39)
Decision: On Jail de ECISO (#500) ou Course touber Course loughde (5550) ( pour molet de 1940 comme le 2E130)
Decision. On fast le Eliso (#500)
Dolle and and for how to
ASTO GERS
245
and and are proof of do
The Dout it different de product do
The state of the s
2) Mex TAILL Off weight ECISO > \$ 5350 De + 350los dixe colembo
0588 1 Har off weight ECISO > \$ 5350
Z) M (Z
En peux pou Miller m paol
M320 EC130
Courses: 7 housen du skid 4.25" us 4,5"
38 H201 25/
Teyes H5350 ex EC130 BP.

Ouote No: 106289 - Page 2 Of 2

NOT INCLUDED: INSURANCE AND CHARGES AT DESTINATION

INSURANCE: \$ 40.00 OR \$ 0.30 / \$100.00

All business conducted is accepted and handled subject to the Standard Trading Conditions adopted by the Canadian International Freight Forwarders Association, available for your review at our website: <a href="www.sdv.ca">www.sdv.ca</a>. Rates are valid only upon receipt of written shipping instructions. Above rates do not apply to over-dimentional, dangerous, restricted and perishable cargo, unless specified. All rates are based on the terms of the current market and subject to change with or without notice.

# Nathalie Barbeau

From: Simon Bernier [simonb@ats-ast.com]

Sent: December-08-10 10:19 AM

To: Nathalie Barbeau

Subject: RE: Compatibilité aux deux hélicos (AS350 et EC130)

Salut Nathalie -

J'ai discuté avec Mirko et il faudrait 20h de plus pour faire le package du AS350. Il faudra faire des nouveaux documents pour le EC130 pour séparer les 2 installations différentes.

### Regards

Simon Bernier

Structure Specialist / Specialiste de Structure

E-Mail: simonb@ats-ast.com

Aviatech Services Techniques Inc. www.ats-ast.com

3005 rue Lindbergh, Trois-Rivières, Qc. G9A 5E1

Tel: (819)601-8049 (Ext:1106)

Fax:(819)377-7928

**De:** Nathalie Barbeau [mailto:nbarbeau@helitowcart.com]

Envoyé: 07/12/2010 10:47

A: Simon Bernier

Objet: RE: Compatibilité aux deux hélicos (AS350 et EC130)

Ok.

J'attends de tes nouvelles

Nathalie

From: Simon Bernier [mailto:simonb@ats-ast.com]

Sent: December-07-10 10:03 AM

To: Nathalie Barbeau

Subject: RE: Compatibilité aux deux hélicos (AS350 et EC130)

Voici un print screen di site de Dart. On voit clairement qu'il y a deux Bearpaw. D130 et D350. En parcourant les fichier à la diagonale les dessin d'installation sont différent, mais le LSTC semble le même. Je dois discuter avec Mirko de la stratégie de documentation ainsi que le surplus de travail, car selon moi 2 produit avec un document d'installation peux porter à confusion.

http://pdart.dyndns.org:3585/sites/ProdSpec/Documents/Forms/AllItems.aspx?RootFolder=%2fsites%2fProdSpec%2fDocuments%2fEurocopter%2fAS350%2c%20AS355%2c%20EC130&FolderCTID=0x012000879D067F9B324446B6D23343735E762C&View=%7b6D935F63%2dB060%2d4E3D%2dBC41%2d5DF65A6CD360%7d

l	D130-700_100927			Bearpaw
	D130-701_101005			Heli-Utility-Basket
	D130-780_100211			Spacepod
	D130-787_100223			Traffic Advisory System
Ì	D350-561_101028			Cargo Mirror
	D350-567_100122			Vertical Reference Floor Window
	D350-578_101125	***************************************		Bearpaw

## Regards

Simon Bernier

Structure Specialist / Specialiste de Structure

E-Mail: simonb@ats-ast.com

Aviatech Services Techniques Inc. www.ats-ast.com

3005 rue Lindbergh, Trois-Rivières, Qc, G9A 5E1

Tel: (819)601-8049 (Ext:1106)

Fax:(819)377-7928

De: Nathalie Barbeau [mailto:nbarbeau@helitowcart.com]

Envoyé: 06/12/2010 16:17

À: Simon Bernier

Objet : RE: Compatibilité aux deux hélicos (AS350 et EC130)

Je n'ai pas eu de nouvelles non plus.

Je viens de l'appeler. Il va regarder cela ce soir.

Il prévoit me contacter dès qu'il aura pris connaissance.

Comme je n'avais pas de nouvelles je me suis fait un sketch de ce qui me semblerait le plus simple comme modifs pour faire un seul pad pour les deux hélicos. Jette-y un coup d'oeil. Je lui ai demandé de faire de même.

Nathalie Barbeau VP Commercial Affairs

Helitowcart (Vanair inc.)

877A Alphonse-Desrochers

St-Nicolas, Levis,

Quebec, Canada, G7A 5K6

tel: +1 418 561 4512 fax:+1 418 836 4575

nbarbeau@helitowcart.com

info@helitowcart.com

www.helitowcart.com

From: Simon Bernier [mailto:simonb@ats-ast.com]

**Sent:** December 6, 2010 3:48 PM

To: Nathalie Barbeau

Subject: RE: Compatibilité aux deux hélicos (AS350 et EC130)

Je n'ai pas eu de nouvelle. Et toi?

#### Regards

Simon Bernier

Structure Specialist / Specialiste de Structure

E-Mail: simonb@ats-ast.com

Aviatech Services Techniques Inc. www.ats-ast.com

3005 rue Lindbergh, Trois-Rivières, Qc, G9A 5E1

Tel: (819)601-8049 (Ext:1106)

Fax:(819)377-7928

**De:** Nathalie Barbeau [mailto:nbarbeau@helitowcart.com]

Envoyé: 03/12/2010 16:32 À: cbeaulieu@coopcscf.com

Cc: lbarbeau@sympatico.ca; info@helitowcart.com; Simon Bernier

Objet: Compatibilité aux deux hélicos (AS350 et EC130)

Christian,

Tel que discuté :

Voilà le premier sketch de Aviatech.

Il n'a pas tenu compte du besoin de matcher le AS350.

Donc tes suggestions sont appréciées s'il y a possibilité de faire un pad pour les deux modèles.

On pourra changer les clips des deux hélicos pour matcher ta suggestion si néc.

Merci

Nathalie Barbeau VP Commercial Affairs

Helitowcart (Vanair inc.) 877A Alphonse-Desrochers St-Nicolas, Levis, Quebec, Canada, G7A 5K6 tel: +1 418 561 4512 fax:+1 418 836 4575 nbarbeau@helitowcart.com info@helitowcart.com www.helitowcart.com

From: Simon Bernier [mailto:simonb@ats-ast.com]

**Sent:** December 3, 2010 2:29 PM **To:** nbarbeau@helitowcart.com **Subject:** EC150 Approbation

Salut Nathalie j'aimerais que tu approuve mon Concept pour le EC150 Bear Paw. Il y a une cote que je n'ai pu respecté selon votre dessin. Voir le PDF en attachement. À noté qu'il est présentement 1.5lbs plus pesant que le BP350. Mirko ma dit que le poids n'était plus un facteur maieur.

Mais je vais peut-être pouvoir le réduire en faisant mon étude de structure. Je préfère attendre ton approbation avant de continuer.

J'attend ta confirmation par E-mail. Merci

Simon Bernier

Structure Specialist / Specialiste de Structure

E-Mail: simonb@ats-ast.com

Aviatech Services Techniques Inc. www.ats-ast.com

3005 rue Lindbergh, Trois-Rivières, Qc, G9A 5E1

Tel: (819)601-8049 (Ext:1106)

Fax:(819)377-7928

A9350 EC BO Rev Dessen Elements Junes en parallete 2 packages 76 weight 330/6s colcols W A Roger Spol SARE: 2 products 3.5 2

# Appendix B FEA Static Analysis BearPAw Pad

Quebec, Canada, G7A 5K6
tel: +1 418 561 4512
fax:+1 418 836 4575
nbarbeau@helitowcart.com
info@helitowcart.com
www.helitowcart.com
----Original Message---From: Jirí PODOLSKÝ - HELI Czech s.r.o. [mailto:podolsky@heliczech.cz]
Sent: November 26, 2010 4:34 AM
To: nbarbeau@helitowcart.com
Subject: Fw: Helitowcart current product prices for R44s( Mr Jiri PODOLSKY, Heli Czech)

Hello Nathalie,
my answer is comming little late, but it will be better.
Thank you, business is going well. I've got dealrship for Robinson helicopter in Slovak
Republic as HELI Slovakia s.r.o. .
I would like two V201s. Your discounts are welcom.
Can you send me proportions and weight of crates?
I would like try one's own transport if it is possible?
Shipping address:
HELI CZECH s.r.o.
Letiste 98
Hradec Kralove 503 41
Czech Republic
Thank you

Best regards
Jiri PODOLSKY
HELI Czech s.r.o
Airport Tocna -PRAHA
Servis Centre Hradec Kralove
CZECH REPUBLIC
www.heliczech.cz
podolsky@heliczech.cz
mob.:+420 608 400 503
FAX:00 420 466 531 209

> ---- Original Message ----> From: "Nathalie Barbeau" <info@helitowcart.com> > To: "Jirí PODOLSKÝ - HELI Czechs.r.o." <podolsky@heliczech.cz> > Sent: Friday, September 03, 2010 2:48 PM > Subject: Helitowcart current product prices for R44s( Mr Jiri > PODOLSKY, Heli Czech) > Hello Jiri! > I hope you are doing well. I would love to hear from you. How is > business at the moment in the Czech Rep.? > In answer to your request: Find attached our current price list and > brochures. > Our base prices in Canadian \$ have not changed in years. The main > change has been the currency fluctuations in Euro, US\$ and GBP. You > may buy in Canadian\$ if you wish. This allows you to save approx. 3% > as this is a safety margin we need to put into our other currency > prices due to daily fluctuations. > I can also offer you the 8% distributor discount on the marked prices.

CLIP DJ BOSSO AUTURU (ATT: BAUDER) ESPACE SOUS LE LITEL GUEL.) E) THREE DE LA PRÉSIEUR QUE LE 2 CHOA BOI USIN CA STOLE STIAT (A : SUOTAGOUSTA 2 Thorete month; shot gue de subreke 2.2) Fairce U-CLIP DJ EC-130 TEC 90E S.P tub :920-Hasitien (1.2) STUD-D 3 "Sts"> ਤਮਤਮ : "S . 0 09857: 11 14): EC (30) 5n5h: "01 SCIAT (P) VOICE ES DAINSTEMENTS REGUIS (hohis

OBJET: OBJECHTE I PAP CENTUR

A : Sindy beeviers, A DARBERY

2010 12 00



# **Packing list**

Address: 877A Alphonse-Desrochers, St-Nicolas, Quebec, Canada, G7A 5K6 email: info@helitowcart.com / Tel:(+1).418 .561.4512 / Fax:(+1).418.836.4575

Date:

December 3, 2010

Invoice:

Bill to:

c/o Kerry Williams

**Buyer Helicopters New Zealand** 

Mailing Address HNZ Bldg, Trent Drive

Nelson Airport 7011

Private Bag 9, Nelson 7042

New Zealand

tel: +64 3 547 5255 (x807)

Fax: +64 3 547 5598 mobile: "+64 3 548 2958

email: kjwilliams@helicoptersnz.co.nz

Shipping to: CPT Perth, Australia

Final Destination: Helicopters (Australia) PTY Ltd

17 Valentine Road

Perth Airport, Perth 6105

Western Australia

Contact: Mr Paul Reimers tel: 0061 8 9277 8399

NAFTA	TPS	Note:			Weight
Vanair 120493044	Vanair 120493044-0001				250lbs (114kg)
Bond	TVQ				Size
Vanair 990458243	100 228 0473 TQ0002				48"x32"x14"
Broker	Sales agent	P.O. No.	Terms	Ship date	Shipping
SDV	Nathalie Barbeau	na	na	Dec. 6, 2010	SDV

		Currency	US\$
Quantity	Description	Unit Price	Amount
· · 1	Repair assembly for V1022 Heli-Carrier	\$0.00	\$0.00
	No charge: Parts under warranty. Value: \$260.		
	(1mainbar, 2 extention bars, 1battery charger, 2mini pins, 4 tire	es)	
	(HS code 8709.90.00)		
	Products Made in Canada	2	

Exporter: Helitowcart / Contact: Nathalie Barbeau.

Sub total \$0.00 **Shipping** \$0.00 **Total** \$0.00

### Nathalie Barbeau

From:

Simon Bernier [simonb@ats-ast.com]

Sent:

December 3, 2010 2:29 PM

To:

nbarbeau@helitowcart.com

Subject:

EC150 Approbation

Attachments: EC150 Concept.pdf

Salut Nathalie j'aimerais que tu approuve mon Concept pour le EC150 Bear Paw. Il y a une cote que je n'ai pu respecté selon votre dessin. Voir le PDF en attachement.

À noté qu'il est présentement 1.5lbs plus pesant que le BP350. Mirko ma dit que le poids n'était plus un

facteur majeur.

Mais je vais peut-être pouvoir le réduire en faisant mon étude de structure. Je préfère attendre ton approbation avant de continuer.

J'attend ta confirmation par E-mail. Merci

Simon Bernier

Structure Specialist / Specialiste de Structure

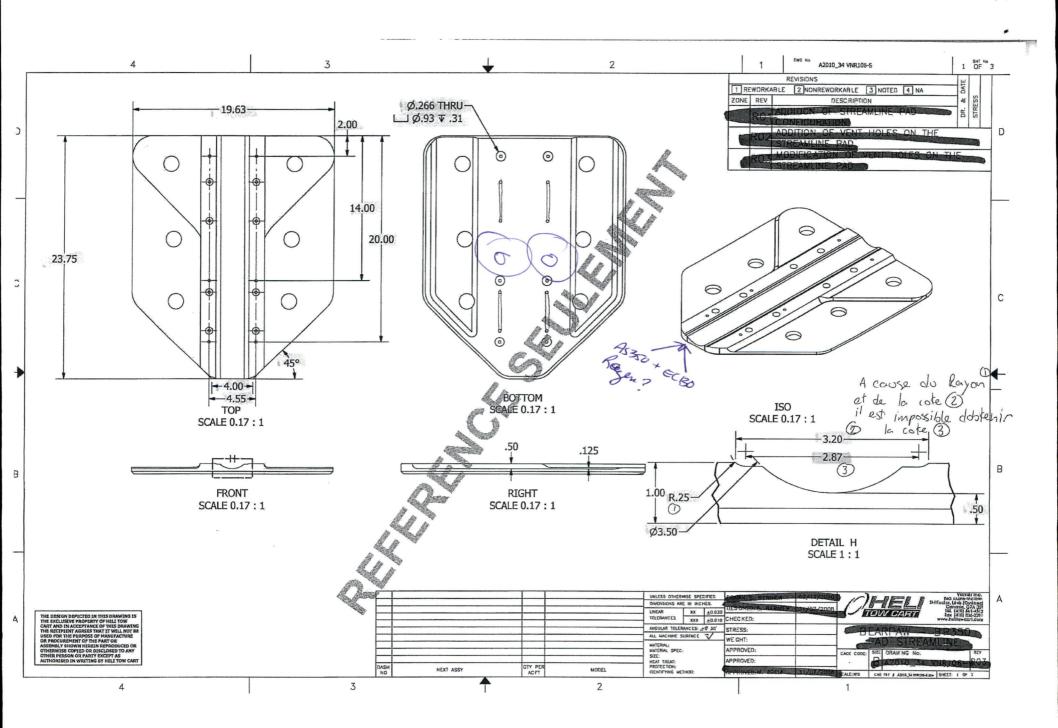
E-Mail: simonb@ats-ast.com

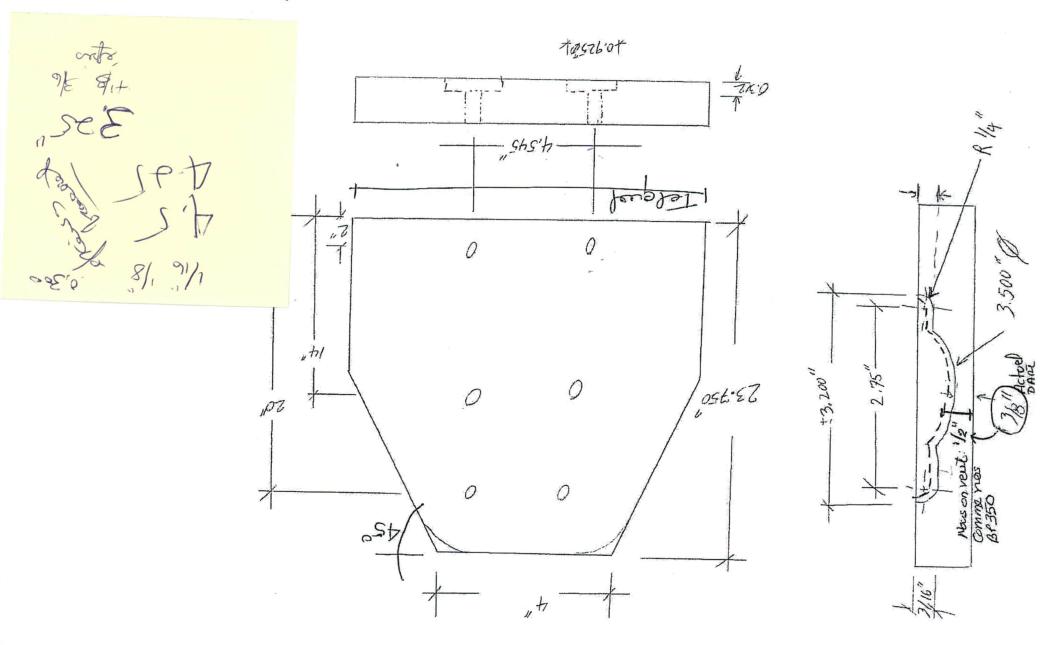
Aviatech Services Techniques Inc. www.ats-ast.com

3005 rue Lindbergh, Trois-Rivières, Qc, G9A 5E1

Tel: (819)601-8049 (Ext:1106)

Fax:(819)377-7928





,



# Department of Transport

# Supplemental Type Certificate

This approval is issued to:

Number: SH93-4

Dart Aerospace Ltd.

Issue No.: 8

1270 Aberdeen Street

Approval Date: March 30, 1993

Hawkesbury, Ontario

Issue Date: July 05, 2010

Canada K6A 1K7

Responsible Office:

 $p_r$ 

Prairie and Northern

Aircraft/Engine Type or Model:

EUROCOPTER FRANCE AS 355 E, AS 355 F, AS 355 F1, AS

355 F2, AS 355 N, AS 355 NP

EUROCOPTER FRANCE AS 350 B, AS 350 B1, AS 350 B2, AS 350 B3, AS 350 BA, AS 350 D, AS 350 D1, EC 130 B4

Canadian Type Certificate or Equivalent:

EUROCOPTER FRANCE AS 350 Series and EC 130 B4: H-83

**EUROCOPTER FRANCE AS 355 Series: H-87** 

Description of Type Design Change:

Bearpaw Installation

# AS 350/355 models

Manufacture of the bearpaw kits must be in accordance with Dart Aerospace Ltd. MDL-D350-578, Revision A, dated 10.06.11, or later approved revision.

Installation of the bearpaw kits must be in accordance with Dart Aerospace Ltd. Drawing D350-578, Revision F, dated 08.08.28, or later approved revision.

Maintenance of the bearpaw kits must be in accordance with Transport Canada accepted Dart Aerospace Ltd. ICA-D350-578, Revision 1, dated 08.08.28, or later Transport Canada accepted revision.

The basis of certification for this modification was FAR 27, up to and including Amendment 27-23.

#### EC 130B4 models

Manufacture of the bearpaw kits must be in accordance with Dart Aerospace Ltd. MDL-D130-700, Revision A, dated 10.06.11, or later approved revision.

Installation of the bearpaw kits must be in accordance with Dart Aerospace Ltd. IIN-D130-700, Revision A, dated 02.10.08, or later approved revision.

.../2



**Conditions:** This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated will not adversely affect the airworthiness of the modified product.

Greg Oucharek For Minister of Transport

Canad**ä** 

# Supplemental Type Certificate

(Continuation Sheet)

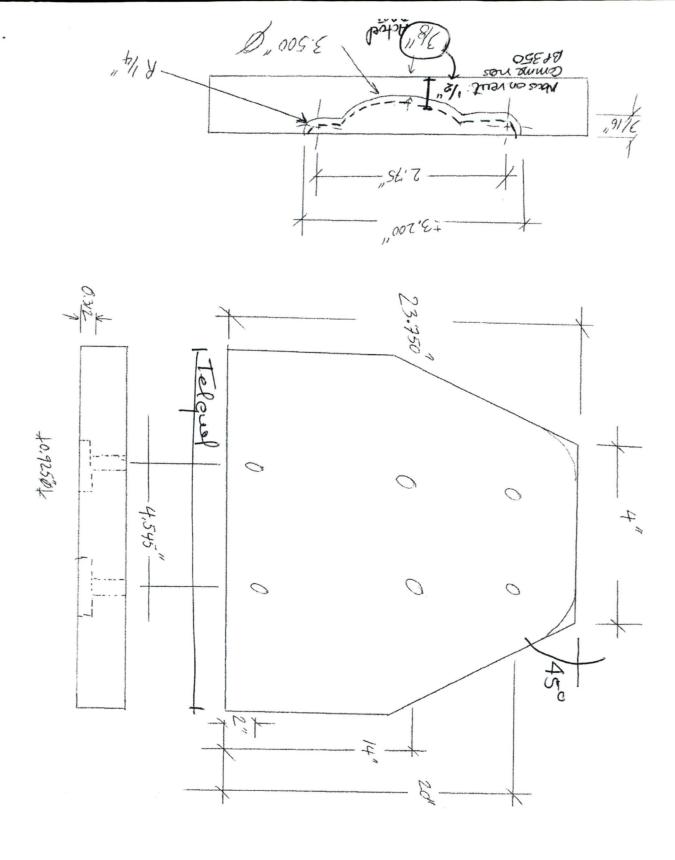
Num	ber:	SH93-4	Issue	8
TAMTIL	DCI.		13346	v

NOTE: THIS ADDENDUM SHALL REMAIN PART OF THE SUPPLEMENTAL TYPE APPROVAL REFERRED TO THEREIN.

Maintenance of the bearpaw kits must be in accordance with Transport Canada accepted Dart Aerospace Ltd. ICA-D130-700, Revision 0, dated 02.10.08, or later Transport Canada accepted revision.

The basis of certification for this modification was FAR 27, up to and including Amendment 27-37.

-END-





2010 11 11

Soumis à :

Mirko Zgela, Aviatech

Par:

Nathalie Barbeau, Helitowcart

Objet:

Information préliminaire pour ajout bearpaw EC130 au STC du BP350

Mirko,

Nous aimerions ajouter une application nouvelle à notre STC du bearpaw 350 , i.e. l'utiliser sur le EC130.

On nous a dit que l'on pouvait effectuer un simple amendement à notre STC puisque les deux applications sont presque identiques. Nous t'avons donc préparé ce kit de documents avec cette perspective en tête.

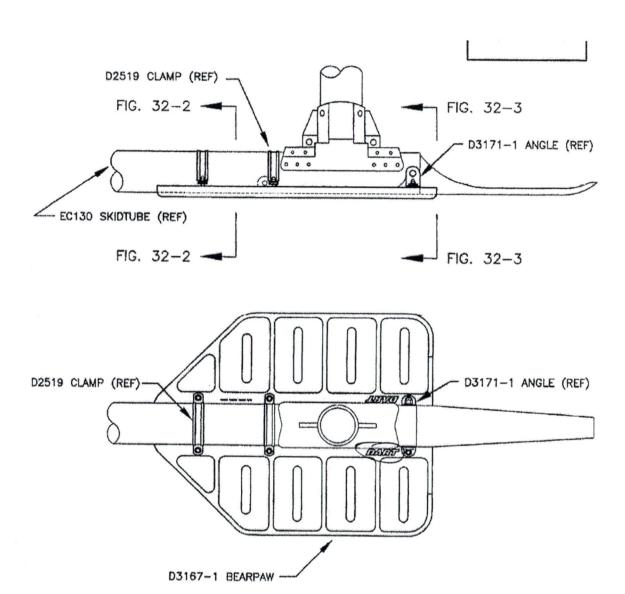
Nous aimerions donc offrir un produit appelé BP130 avec le même kit de documents que le BP350. On y indiquerait à l'intérieur les spécificités de chacun des modèles.

Afin de faciliter une telle démarche, j'ai préparé une ébauche préliminaire qui comprend les données qui devraient être adaptées pour introduire cette application avec simplicité. J'espère que cela pourra te faciliter la tâche!

Salutations chaleureuses,

Nathalie Barbeau Heliltowcart

# Vision d'ensemble d'un modèle :

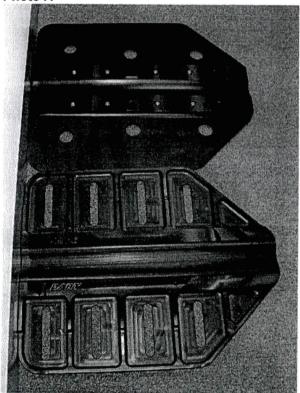


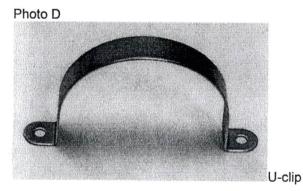
## Identification des différences avec le BP350 :

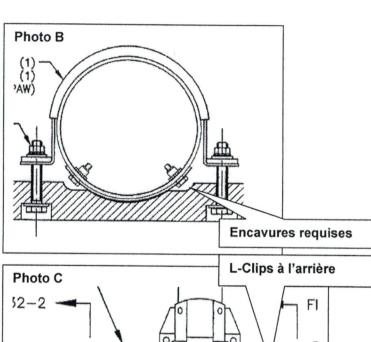
Nous avons identifiés les ajustements principaux qui seront requis au niveau de :

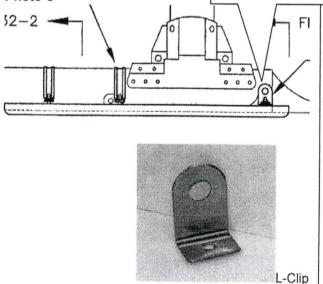
- 1) Taille du périmètre : Notre pad est moins pointu à l'avant, nous allons le faire faire plus pointu comme celui du modèle pour éviter qu'il frotte potentiellement sur des roues.
- 2) Taille du diametre du skid: Il faut élargir un peu le nôtre. Le skid du EC130 a environ ¼" de plus large. De plus il faut faire une petite encore de chaque côté de cette encavure en rond car il faut laisser de la place pour des boulons situés sur le skid (voir photo B)
- 3) Déplacement longitudinal des trous d'attaches au skid : Les trous pour les U-clips d'attache au skid doivent être positionnés plus à l'avant et/ou plus à l'arrière que ceux de nos BP350 selon le cas. Cet ajustement des trous demande que nous déplacions légèrement une paire de iceblades un peu plus vers l'avant.
- 4) **Un U-Clip remplacé par deux L-clips**: Au lieu d'un 3<sup>e</sup> U-clip à l'arriere du pad, il faut mettre deux L-shaped clips car le skid ne permet pas l'usage d'un U-clip. Voir Photo C
- 5) **U-clips plus larges** : nous devons fabriquer un U-clip de plus grande taille que celle des BP350, mais le principe reste le même

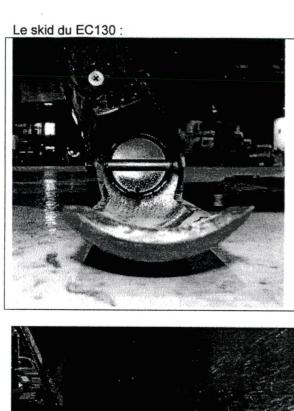
#### Photo A

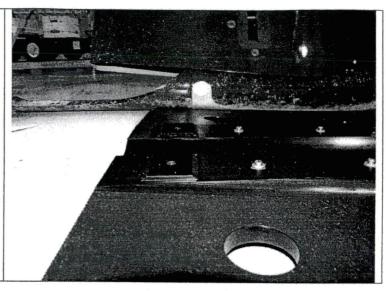


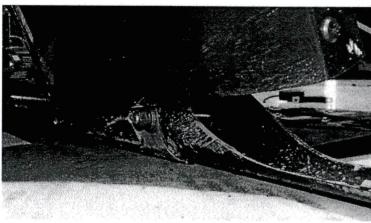


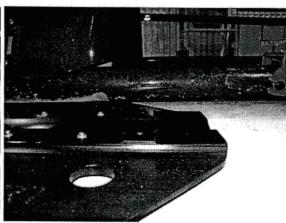


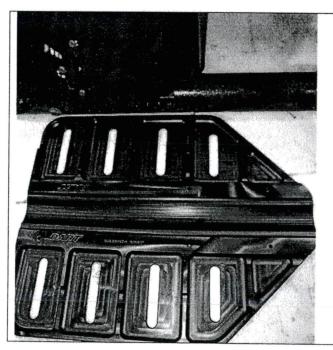


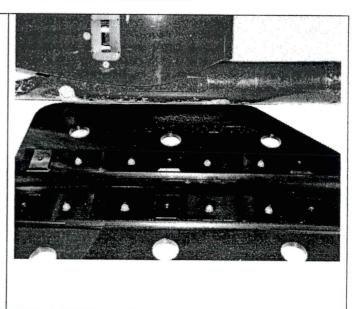












# **Planned Parts List**

Current BP350		BP130
Pad Part name : BP350-Pad P/N : 314-0018-01-C, (i.e. rev.C) Qty: 2		Pad <i>(new part)</i> Part name : BP130-Pad P/N : 314-0024-01-A, (i.e. rev.A) Qty: 2
Iceblades Part name: Iceblade P/N: 263-0005-15-A Qty: 8	43	Iceblades (same) Part name: Iceblade P/N: 263-0005-15-A Qty: 8
U-clips Part name: BP350- U shaped clip P/N: 314-0019-15-A Qty: 6		U-Clips - Large (new part) Part name: BP130 – U Shaped clip P/N: 314-0026-15-A Qty: 4
Heat Shrink Part name: Bearpaw – Heat shrink 1"x6.25" black P/N: 314-0021-01-A Qty: 6		Heat Shrink (same part) Part name: Bearpaw – Heat shrink 1"x6.25" black P/N: 314-0021-01-A Qty: 4
n/a		L-Clips (new part) Part name: BP130 – L Shaped clip P/N: 314-0025-15-A Qty: 4
Slotted clip support Part name: Slotted clip support P/N: 314-0007-15-B Qty: 12		Slotted clip support (same) Part name: Slotted clip support P/N: 314-0007-15-B Qty: 12 (? Qty to be determined)
Filler blocks Part name: Filler block 1/4" thick: P/N 314-0012-01-A Qty: 12 Other models in use at Helitowcart: 3/32"thick: P/N 314-0014-01-A 1/8" thick: P/N 314-0015-01-A		? To be determined if needed only
Bolt Part name: Bolt AN4-14A P/N: 261-0001-17-A Qty: 12  Other models in use at Helitowcart: 15A: 261-0002-17A 16A: 261-0003-17A		Bolt (new model if matching model) Part name: Bolt AN4-12A P/N: 261-0005-17-A Qty: tbd, if possible I would prefer we do not use this 12A size as we would need to order it just for this one. So please try to use the 14A, 15A or 16A as much as possible as we have these in stock
n/a		Bolt (model in stock if matching model) Part name: Bolt AN4-16A P/N: 261-0003-17-A Qty: tbd

Current BP350	BP130		
Nuts Part name: Nuts MS20-365-428 // Cadmium, Wrench 7/16", 28 Threads per inch, Teflon self locking P/N 262-0001-17-A Qty: 12 for clips Qty: 16 for iceblades Qty Total: 28 per pair		Nuts (same) Part name: Nuts MS20-365-428 // Cadmium, Wrench 7/16", 28 Threads per inch, Teflon self locking P/N 262-0001-17-A Qty: 12 for clips Qty: 16 for iceblades Qty Total: 28 per pair	
Washers Part name: Washer AN960-416 //Cadmium, Diameter 1/2", Hole:0.265", Thickness:0.065" Qty: 16 for Iceblades Qty: 12 for L and U shaped clips Total: 28 washers for the pair		Washers (same) Part name: Washer AN960-416 //Cadmium, Diameter 1/2", Hole:0.265", Thickness:0.065" Qty: 16 for Iceblades Qty: 12 for L and U shaped clips Total: 28 washers for the pair (if the installer reuses the helicopter's own washers on the bolts that are already on the helicopter where the L-shaped clips are used.)	
n/a		Large Washers (new part) Part name: Large Washers P/N: 261-0002-17-A (this P/N will only be created if necessary, tbd only if we need to use these) Qty: 12 but need for it tbd  Model: Diameter: 0.623", thickness: 0.057", hole: 0.289"	

# Department of Transport

# Supplemental Type Certificate

This approval is issued to:

Helitowcart Inc.

860 Marie-Victorin

St-Nicholas, Levis, Quebec

Canada G7A 3S9

Responsible Office:

Aircraft/Engine Type or Model:

Canadian Type Certificate or Equivalent:

Description of Type Design Change:

Installation/Operating Data, Required Equipment and Limitations:

Number: SH06-24

Issue No.:

Approval Date: August 17, 2006

Issue Date:

December 19, 2006

Quebec

The we have it updated

See Continuation please correct mistake

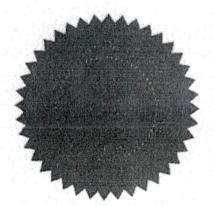
See Continuation marked below

For the Robinson Models R44 and R44 II Helicopters:

Installation of Helitowcart Bear Paw Model BP350 is to b Helitowcart Inc. Master Document List, Report: HTC-M 8, 2006, or later Transport Canada approved revision.

The BearPaw must be installed in accordance with Helitowcart Inc. Installation Instructions Document: "314-0011-00-A, BearPaw Model BP44, Installation Instructions - R44" as specified by Helitowcart Inc. Master Document List, Report: HTC-MDL-BP-R44-1000.

See Continuation Sheet Page 2 of 2



Conditions: This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated will not adversely affect the airworthiness of the modified product.

> Pierre G. Richard For Minister of Transport

Piece S. Ruhard



Number: SH06-24 Issue 2

NOTE: THIS ADDENDUM SHALL REMAIN PART OF THE CERTIFICATE REFERRED TO THEREIN.

# Installation/Operating Data, Required Equipment and Limitations (Cont'd):

# For the Eurocopter (formerly Aerospatiale) AS350 and AS355 Series Helicopters:

Installation of Helitowcart Bear Paw Model BP350 is to be performed in accordance with TC approved Helitowcart Inc. Master Document List, Report: HTC-MDL-BP-AS350/355-1000, Revision A dated November 22, 2006, or later Transport Canada approved revision.

The BearPaw must be installed in accordance with Helitowcart Inc. Installation Instructions Document: "314-0020-00-A, BearPaw Model BP350, Installation Instructions - AS350/355" as specified by Helitowcart Inc. Master Document List, Report: HTC-MDL-BP-AS350/355-1000.

	Fleet Eligibility List	
Make	Model	Type Certificate Data Shee
Robinson	R44	H-97
Robinson	R44 II	H-97
Eurocopter	AS 350 B	H-83
Eurocopter	AS 350 B1	H-83
Eurocopter	AS 350 B2	H-83
Eurocopter	AS 350 B3	H-83
Eurocopter	AS 350 BA	H-83
Eurocopter	AS 350 D	H-83
Eurocopter	AS 350 D1	H-83
Eurocopter	AS 355 E	H-87
Eurocopter	AS 355 F	H-87
Eurocopter	AS 355 F1	H-87
Eurocopter	AS 355 F2	H-87
Eurocopter	AS 355 N	H-87



# **Master Document List**

Helitowcart

# Eurocopter Model AS 350/355/Series Helicopters Installation of BearPaw Model BP350 or BP30

Report: HTC-MDL-BP-AS350/355-1000 (Rev,F) G

APPROVED BY:

DATE: <u>APRIL 8, 2010</u>

Design Approval Representative DAR #310

Revision	Revision Date Revision of Entry		Entered by
А	Nov 22, 2006	Initial issue	N/A
В	Jan 28, 2007	Revision performed to the Installation Instructions (Doc # HTC-314-0020-00)	M.Z.
С	Feb 28, 2007	Addition of streamline pad configuration. Revision performed to the Installation Instructions (Doc # HTC-314-0020-00)	M.Z.
D	July 27, 2008	Addition of vents holes in the streamline pad.	M.Z.
E	Aug 01, 2008	Modification of vents holes in the streamline pad.	M.Z.
F	April 8, 2010	Revision performed to the Installation Instructions (Doc # HTC-314-0020-00)	M.Z.
6		Add BP130	

Page 1/3



# **MASTER DOCUMENTS**

Document #	Title	Revision Status	Approval by	Date
AAC-CPL-BP-AS350/355- 1000	Compliance Plan – Eurocopter Model AS350/355 Series Helicopters – (2) Installation of BearPaw Model BP350	NC (S	) DAR 310	Nov 22, 2006
HTC-314-0020-00	BearPaw Model BP350 – Installation Instructions – AS350/355/Series Helicopters	FF	DAR 310	April 8, 2010
AAC-STR-BP-AS350/355- 1000	Structural Substantiation – Helitowcart Inc. BearPaw Model BP350 (2)	NC(3)	DAR 310	Nov 20, 2006
AAC-FTR-C-GZNC	Simple External Modification – Applicant's Flight Test Plan/Report	NC	DAR 310	Nov 21, 2006
HTS-EO-0709-002	Bear Paw Model BP350 Vent Holes	Α	DAR 310	July 31, 2008
HTC-MEM-0709-001	Memorandum – Vent Hole BP350 BearPaw	Α	DAR 310	July 31, 2008
?	?			

# **MASTER DRAWINGS**

00	9	_	
14	3	5	

)	Drawings #	Title	Revision Status	Approval by	Date
	112-0002-00	BearPaw BP350 - Assembly	В	DAR 310	Nov 20, 2006
	112-0002-00-S	BearPaw BP350 – Assembly Streamline	С	DAR 310	July 31, 2008
1	VNR084	BearPaw - Iceblade	R01	DAR 310	Apr 24, 2006
`	VNR085	BearPaw - Iceblade Threaded Rod	R01	DAR 310	Apr 24, 2006
7	VNR086	BearPaw – Iceblade Assembly	R01	DAR 310	Apr 24, 2006
	VNR106	BearPaw BP350 - Pad	R02	DAR 310	Sept 26, 2006
	VNR106-S	BearPaw BP350 – Pad Streamline	R03	DAR 310	July 31, 2008
	VNR107	BearPaw BP350 – U Shaped Clip	R01	DAR 310	Sept 29, 2006
1	VNR089	Bearpaw – Slotted Clip Support	R04	DAR 310	July 31, 2006
	VNR099	Filler Block 1/4"	R01	DAR 310	Aug 8, 2006

BP130

112-0005-00 Bearpour BP130-Assy VNR 106-5-130/Bearpaw BP130-PAD VNR 084 VNR 086 VNR 086 VNR 086 VNR 086 VNR 086 VNR 089

Page 2/3

314-0026-15/BP130-Lishaped dip A 314-0025-15/BP130-Lishaped dip Apom www.helitowcart.com



# 3.0 REFERENCE DOCUMENTS

Document #	Title	Revision Status	Approval by	Date
314-0009-01-A	Ultra High Molecular Weight Polyethylene  - Typical Properties	Α	N/A	May 24, 2006
314-0008-01-A	Material Properties - UHMW TIVAR	Α	N/A	May 24, 2006
314-0017-05-A	Heat Shrink Specifications	Α	N/A	Sept 6, 2006



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INSTALLATION BearPaw Installation BearPaw Removal Weight & Balance Parts List	<ul><li>p.3</li><li>p.5</li><li>p.5</li><li>p.5</li></ul>	
INSPECTION Life Limited Items Pre-Flight Periodic Inspection Schedule 500 Hour or Yearly Inspection Details Overhaul Requirements	<ul><li>p.6</li><li>p.6</li><li>p.6</li><li>p.6</li><li>p.6</li></ul>	
REVISIONS & APPROVAL	p.7	
Annex A (BearPaw Assembly Drawing) Annex B (BearPaw Pad Drawing)		/

X

#### INTRODUCTION

#### Scope

This installation instruction describes the step-by-step approach to install and to perform maintenance of the Helitowcart BearPaw Model BP 350 (P/N 112-0002-00 or P/N 112-0002-00-S) for the AS 350 and AS 355 series helicopters and the helitowcart Bearpaw Todel BP130 (P/N 112-0005-00) for the EC130B4.

### General

The Helitowcart BearPaw is made of machined UHMW TIVAR® polymer sheet. This material combines high-impact performance, low friction and good resistance to chemical. Its high durability will provide superior performance when installed on your helicopter. Any question regarding the Helitowcart BearPaw system shall be directed to Helitowcart Customer Support as indicated in Table (1):

# Table 1 - Helitowcart Customer Support

Care of	Mailing Address	Phone, Fax & Email:
Customer Support	860 Marie-Victorin	Tel:1 (418) 561-4512
Helitowcart BearPaw	St-Nicholas, Levis, Quebec,	Fax:1 (418) 836-2291
Helitowcart (Vanair inc)	Canada, G7A 3S9	info@helitowcart.com

## **Helicopter Effectivity**

This installation instruction applies to the following helicopter models:

# Table 2 - Helicopter Model Effectivity

Make	Model	Transport Canada Type Certificate Data Sheet
Eurocopter	AS 350 D	
Eurocopter	AS 350 D1	
Eurocopter	AS 350 B	
Eurocopter	AS 350 B1	H-83
Eurocopter	AS 350 B2	
Eurocopter	AS 350 B3	
Eurocopter	AS 350 BA	
Eurocopter	AS 355 E	
Eurocopter	AS 355 F	
Eurocopter	AS 355 F1	H-87
Eurocopter	AS 355 F2	
Eurocopter	AS 355 N	
n	EC 130 BA ?.	Page 2 of 16



# Installer Responsibilities

The installer shall ensure that the installation of the Helitowcart BearPaw does not conflict with any other part of the helicopter configuration. Technicians performing this installation should be familiar with A/C work and should have been familiarized with the different Helitowcart BearPaw system components prior to performing a first time installation. All steps in this procedure must be followed. Deviations from the procedures may result in potential structural failure or equipment malfunction and will result in a non-compliant installation.

#### INSTALLATION

# **BearPaw Installation**

Reference Documentation:

Helicopter Maintenance Manual AS 350, x AS 355, as applicable.

# Step 1: Helicopter Preparation

Ensure the helicopter is safe for maintenance:

Lift the helicopter using the manufacturer recommended practice provided in Ref [1] as applicable to your helicopter model to allow a ground clearance of the skid in the area of the aft cross tube of approximately 1 1/2" (38mm);



X

TBD

The BearPaw Model BP350 (P/N 112-0002-00 or P/N 112-0002-00-S) can be installed with or without the skid tube wear shoes.

# Step 2: IceBlade Installation

The BearPaw Model BP350 (P/N 112-0002-00 or P/N 112-0002-00-S) can be installed with or without the IceBlades

BP130 (P/N12.0005.00

With IceBlade Option

Install ice blades (Qty: 4) (Iceblades P/N 314-0005-15) under BearPaw pad as per drawing (112-0002-00 pr 112-0002-00-S) provided at Annex A. Secure ice blades with washer (Washer P/N 263-0001-17) and nut (P/N 262-0001-17).

#### Step 3: BearPaw Installation

Position the BearPaw under the skid as shown in Figure 1 with narrow edge pointing forward.

Insert washers (P/N 263-0001-17) through all six bolts: 6x(261-0001-17);

Insert bolts (P/N 261-0001-17) and washer (Washer P/N 263-0001-17) through BearPaw pad as per drawing (112-0002-00 or 112-0002-00-S) provided at Annex A;

Insert filler blocks (P/N314-0012-01) as per drawing (112-0002-00 or 112-0002-00-S) provided at Annex A:

The use of filler blocks (P/N314-0012-01) may be replaced or complemented by the use of washers (P/N 263-0001-17) to fill in the gap. Bolts (P/N 261-0001-17) may be replaced by longer or shorter AN4 bolts as required.

Page 3 of 16



TBD

- Insert both U-shaped clips (P/N 314-0019-15) through bolts: 6x(261-0001-17);
- Insert slotted clip supports (P/N 314-0007-15) through all six bolts. Position slotted clip supports with rounded edge toward helicopter skid;
- Insert washer (P/N 263-0001-17) & screw nuts (P/N 262-0001-17) for a tight fit. Max. torque on nuts 60 in.-lb;
- Remove helicopter from lift;
- Amend Weight & Balance records as required using data provided in Table 3.

Figure 1 – BearPaw Model BP350 (P/N 112-0002-00 or P/N 112-0002-00-S) - Alignment on Skid

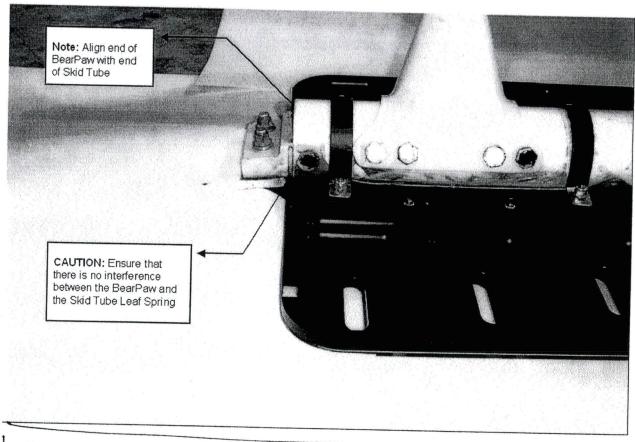


Fig 2
BP130

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#### **BearPaw Removal**

Step 1: Helicopter Preparation

- Ensure the helicopter is safe for maintenance;
- Lift the helicopter using the manufacturer recommended practice provided in Ref [1] to allow a clearance of the skid in the area of the aft cross tube of approximately 1 1/2" (38mm);

# Step 2: BearPaw Removal

- Remove nuts (P/N 262-0001-17), slotted clip support (P/N 314-0007-15) on U-shaped clips (P/N 314-0007-15) 0019-15),
- Remove washers (P/N 263-0001-17), U-shaped clips (P/N 314-0019-15), filler blocks (P/N314-0012-01), and remove BearPaw pad (P/N 314-0018-01);
- Inspect skid tubes to confirm serviceability
- If the skid tube shoes have been removed, re-install shoes as per reference [1];
- Complete installation by putting helicopter back to normal position by removing lift status;

Amend Weight & Balance records as required using data provided in Table 3.

# Weight & Balance

The following information should be used to amend the helicopter weight and balance information following the installation or removal:

Table 3 - Weight & Balance Data

	A	The state of the s	it & balance Data		
Item Weight		Lateral		Longitudinal	
Daile Control of the	1 779 1	Arm	Moment	Arm	Moment
Helitowcart BearPaw Model BP350 (P/N 112-0002-00)	19,9 Lb 9,0 Kg	N/A	N/A	159,4 in. 404.9 cm	3172.0 in-lb 36.44 m-kg
Helitowcart BearPaw Model BP350 - Sreamline (P/N 112-0002-00-S)	18,3 Lb 8,5 Kg	N/A	N/A	159,4 in. 404.9 cm	2917.0 in-lb 34.41 m-kg
Note: Weight and moment	provided are	e for full kit insta	llation.		
BP130					
Parts Lists	1		(	'	

The Helitowcart BearPaw detailed parts list is as follow:

Table 4 Parts List BP350

No. of the second	R15 2 R 11 P 20 P 12 P 20 S 20 S 20 P 20 P 20 P	o i, Turio Eist Di 200	
Qty	Part No.	Drawing no./name	
1	112-0002-00	VNR(112-0002-00) / BearPaw Assembly VNR (112-0002-00-S) /Bear Paw Streamline Assembly	
1	314-0018-01	VNR106 / BearPaw BP350 - Pad	
1	314-0018-018	VNR106S / BearPaw BP350 – Pad Streamline	
3	314-0019-15	VNR107 / BearPaw BP350 - U Shaped Clips	
6	314-0007-15	VNR089 / BearPaw - Slotted Clip Support	
	1 1 1 3	Qty         Part No.           1         112-0002-00           1         314-0018-01           1         314-0018-01S           3         314-0019-15	

Page 5 of 16

Tel: 1-418-561-4512, Fax: 1-418-836-2291, 860 Marie-Victorin, Saint-Nicolas, Levis, Québec, Canada G7A 3S9. www.helitowcart.com info@helitowcart.com







Filler blocks 1/4"	6	314-0012-01	VNR099 / BearPaw - Filler block 1/4"
Bolts	6	261-0001-17	Bolt- AN4-14
Nuts	6	262-0001-17	Nut- MS20365-428
Washers	12	263-0001-17	Washer - AN960-416
Shrink	3	314-0021-01	BearPaw - Shrink Specifications & Install.(1"x6.25")
IceBlade Option Model OIB	4	314-0005-15	VNR086 / IceBlade Assembly
Nuts	8	262-0001-17	Nut- MS20365-428
Washers	8	263-0001-17	Washer - AN960-416

Note (1): Use BearPaw Pad P/N 314-0018-01 for VNR P/N 112-0002-00 and BearPaw Pad P/N 314-0018-01-S for VNR P/N 112-0002-00-S as applicable.

Told 4.2 Parts lest BP13C

#### INSPECTION

#### **Life Limited Items**

Three are no life limited items for the Helitowcart BearPaw.

## Pre-Flight

Before each flight the following items should be inspected:

- · Check that attachment bolts are installed and secured.
- Check that BearPaws are free from visible damage,
- If damage is found, verify allowable damage according to: Table 5 – Tolerances for cracks & wear and Annex B – BearPaw Allowable Damage Drawing (VNR106 page)

Annex B – BearPaw Allowable Damage Drawing (VNR106 page 2 of 2) VNR 106S page 2 of 2) VNR 106-5.

### **Periodic Inspection Schedule**

- The Helitowcart BearPaw shall be inspected every 500 flying hours or yearly whichever comes first.
- The Helitowcart BearPaw can be inspected concurrently with the helicopter landing gear inspection.
- Recommended tolerance for performance of inspection is +/- 10% of the 500 hours period.
- Following an inspection, subsequent interval shall be adjusted to meet the original schedule from time
  of inspection. If inspection is performed earlier than the 10% tolerance, then following inspections
  shall be scheduled not to exceed the above mentioned tolerance.

# 500 Hour or Yearly Inspection Details

- Remove Helitowcart BearPaw: See Section "BearPaw Removal",
- Inspect all parts for damage & wear. See table & figure below for allowable damage,
- · Replace all damaged parts,
- Replace parts worn beyond the tolerances indicated below.
- See Tolerances for cracks & wear:

Table 5 - Tolerances for cracks & wear, &

Annex B - BearPaw Allowable Damage Drawing (VNR106 page 2 of 2) VNR 106S page 2 of 2) VNR 106S page 2 of 2) VNR 106S page 2 of 2)

Table 5 - Tolerances for Cracks & Wear

Zone	Nominal Dimension (Inches)	Allowable Damage/Wear (Inches)	Cracks
Α	0,50	0,050	
В	1,000	0,250	

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С	0,375	0,075	Pockets: Cracks are acceptable in the Helitowcart BearPaw pocket areas to a maximum length of 0,5" provided they are 0,25" away from the stiffener radius change. Stop drill cracks with a 0,125" hole.
D	0,50	None	Stiffeners: NO cracks in stiffeners.
E	0,375	0,075	For P/N 112-0002-00-S Only

# **Overhaul Requirements**

Not applicable for the designated application of this device.

# **REVISIONS & APPROVAL**

#### Revisions

Date	Rev	Nature of Revisions	
Nov 20,2006	А	Initial issue	
Jan 29, 2007	В	Minor editorials.  Change to weight & Balance Data to reflect production model.  Change in inspection schedule from 300 to 500 hours to match existing anding gear periodicity.	
Feb 28, 2008	С	ntroduction of new streamline BearPaw Pad configuration as alternate.	
Aug 01, 2008	D	Modification of vent holes on the streamline pad	
April 8, 2010	E	Correction to CofG data	
κ	F	Extended to EC130	

# Approval

Internal Approval : Helitowcart inc.	Lucien Barbeau, President	April 8, 2010 Date:
External Approval:	, coldon	
Transport Canada	Mirko Zgela, DARI#310	April 8, 2010 Date:

Page 7 of 16



# Annex A

See: BearPaw Assembly, drawing no. (112-0002-00) or; BearPaw Assembly, drawing no. (112-0002-00-S)

112-0005-00

# Annex B

See: BearPaw Pad, drawing no. VNR106. Page 2 of 2 or; BearPaw Pad, drawing no. VNR106-S. Page 2 of 2.

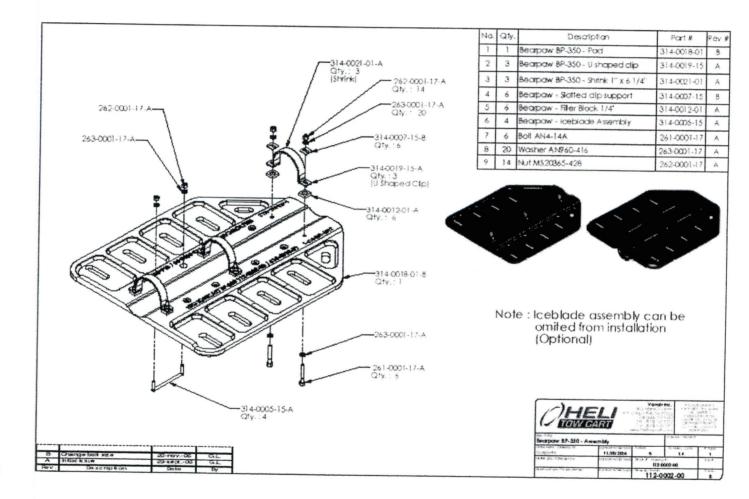
VAR106-5-130 page - of -



# Annex A

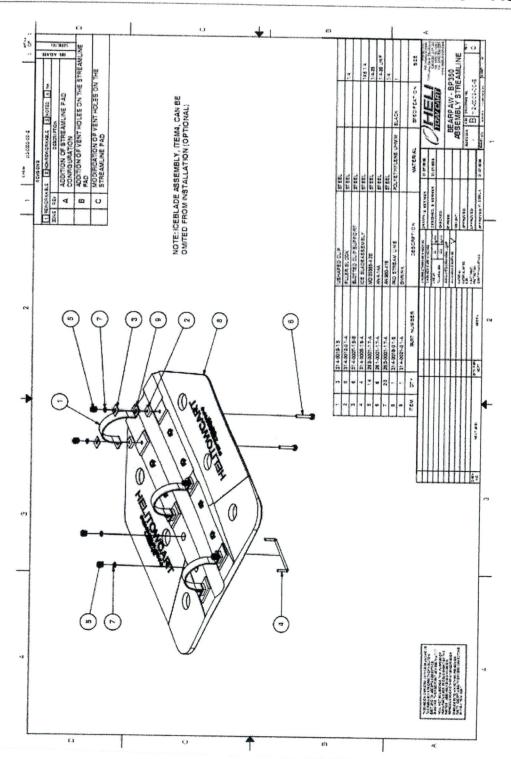
BearPaw Assembly, Drawing no. VNR(112-0002-00). P/N 112-0002-00





#### Annex A

BearPaw Assembly, Drawing no. VNR(112-0002-00-S). P/N 112-0002-00-S



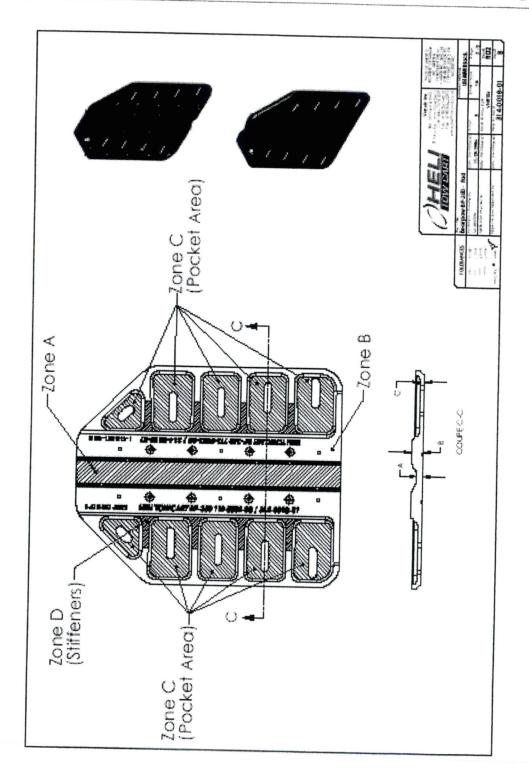
Page 12 of 16



#### Annex B

BearPaw Pad, Drawing no. VNR106. Page 2 of 2. P/N 314-0018-01



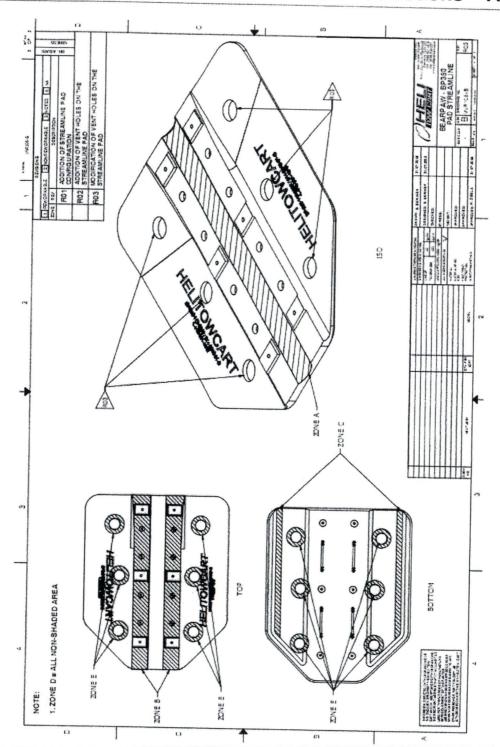


Page 14 of 16

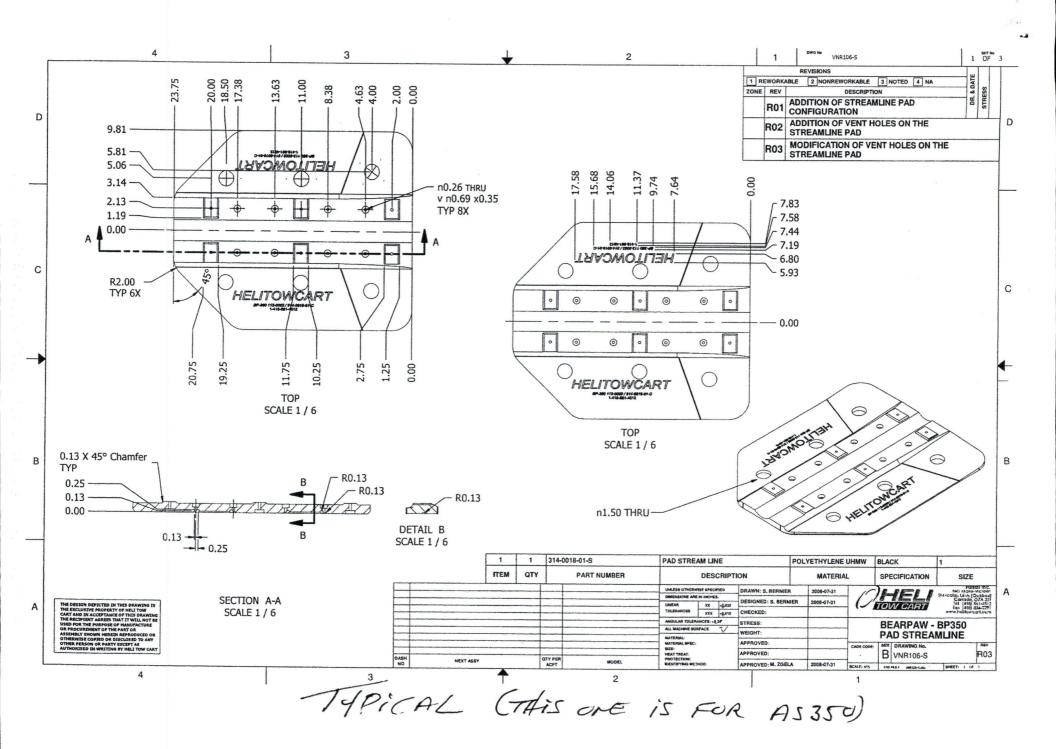


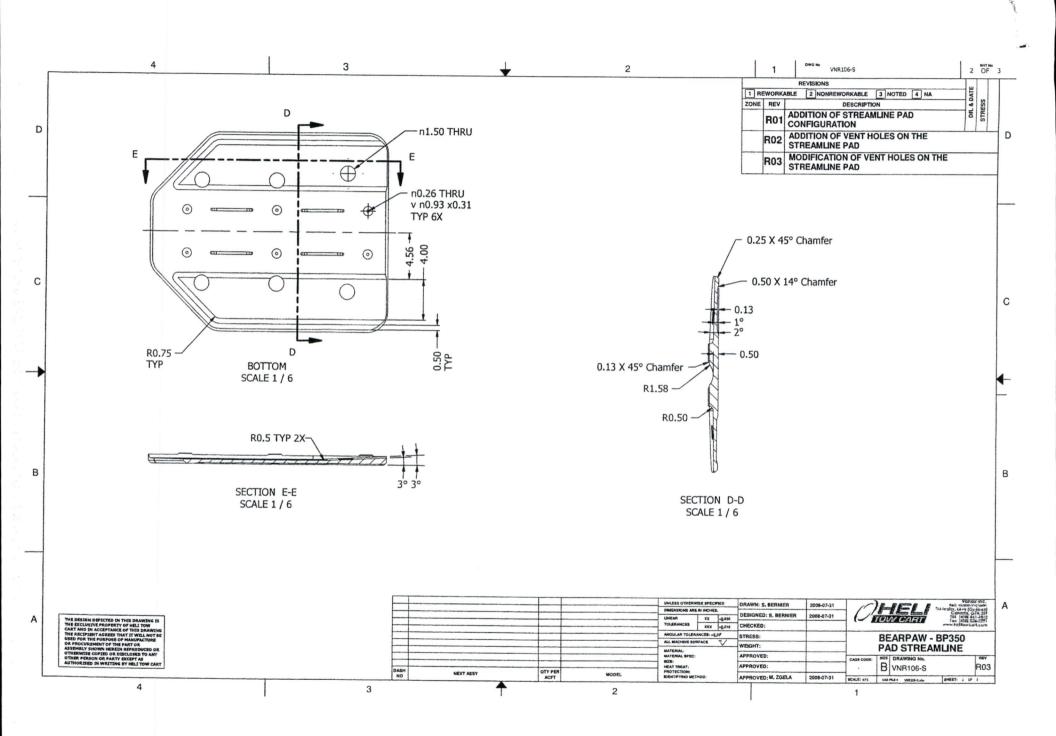
Annex B

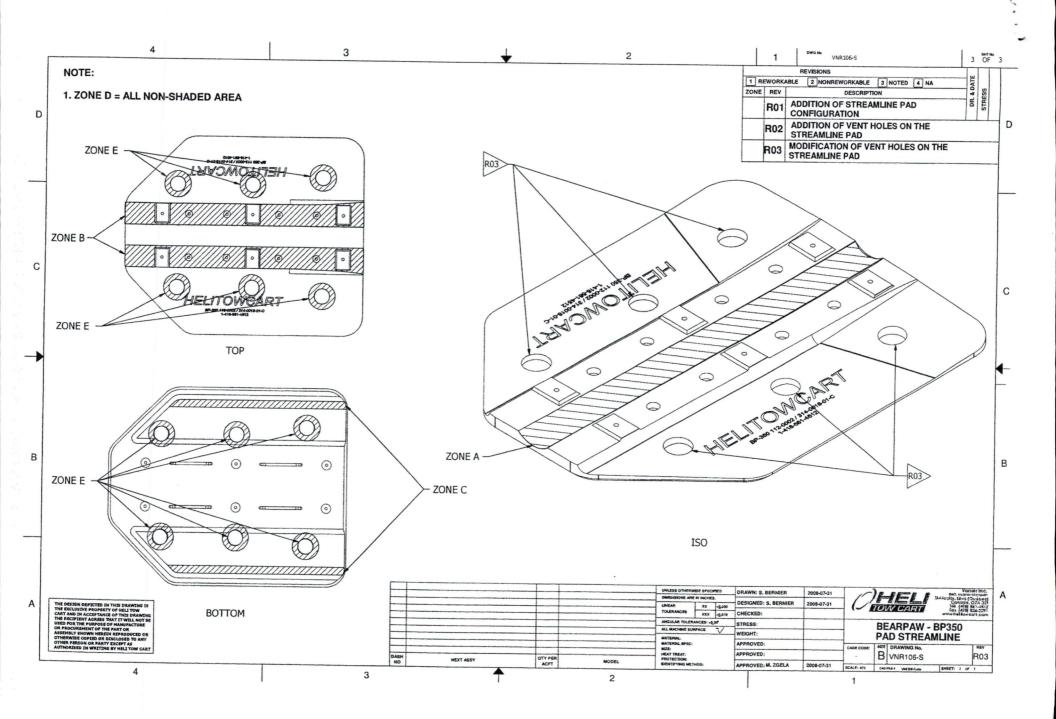
BearPaw Pad, Drawing no. VNR106S. Page 2 of 2. P/N 314-0018-01-S

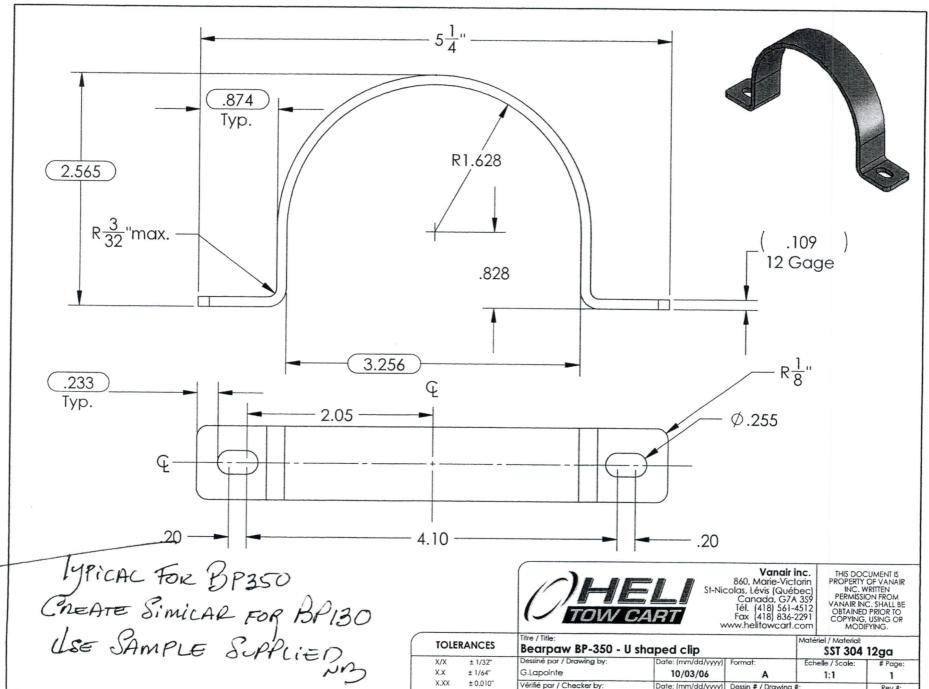


Page 16 of 16







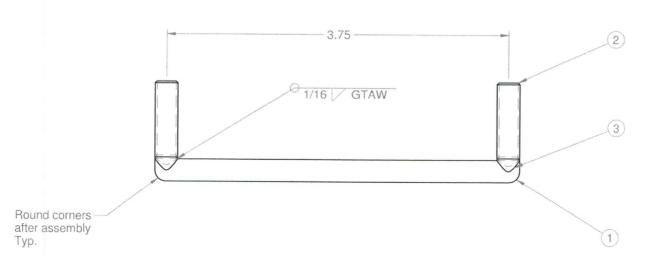


B Change bolt size 10/03/06 G.L. A Initial Issue 09/29/06 G.L. Description

TOLER	TOLERANCES Title: Bearpaw BP-350 - U shaped clip					
X/X	± 1/32"	Dessiné par / Drawing by:	Date: (mm/dd/yyyy)	Format:	Echelle / Scale:	# Page:
X.X	± 1/64"	G.Lapointe	10/03/06	Α	1:1	1
X.XX X.XXX	± 0.010" ± 0.005"	Vérifié par / Checker by:	Date: (mm/dd/yyyy)	VN	#: R107	Rev #:
ANGLES ± 1°		Approuvé par / Approved by:	Date: (mm/dd/yyyy)		019-15	Rev #:



	<b>,</b>		
N°	Qty:	Description	Doc #
1*	1	Bearpaw – Iceblade	314-0002-15-A
2*	2	Bearpaw – Iceblade threaded rod	
3*	2	Filler Material AWS A-5.9 / ASME SFA-5.9	





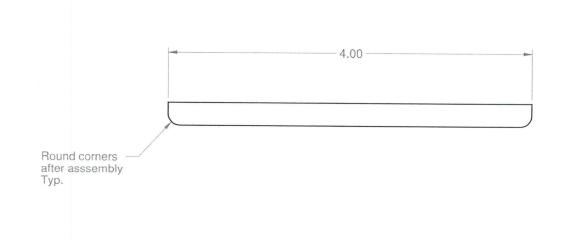
1/X ± 1/32" X.XX ± 0.010" X.XXX ± 0.005" ANGLE ± 1° PROJECTION: 🕀 🗀

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	I.	1 1	
R1	Initial issue	03-08-06	G.L.
Rev.	Description	Date	By

Titre / Title Bearpaw - Id	Matériel / Material:			
Dessiné par / Drawing by: G. Lapointe	Date: (yyyy-mm-dd) 2006-04-24	Format :	Échelle / Scale: N/A	Page #: 1 de 1
Vérifié par / Checked by:	Date: (yyyy-mm-dd)	Numéro dessin / D	rawing Number: VR086	Rev.#.
Approuvé par / Approved by:	Date: (yyyy-mm-dd)	Numéro de pièce / Part Number: 314-0005-15-		Rev.#.



Ø 1/4 in Raw material

Note: Raw material specification: Stainless steel 304 annealed Rod

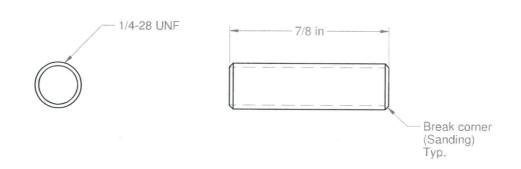


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Rev.	Description	Date	Bv
R1	Initial issue	03-08-06	G.L.

TOLERANCES	Titre / Title Bearpaw - Icel	Matériel / Material: See	Note		
1/X ± 1/32"	Dessiné par / Drawing by:	Date: (yyyy-mm-dd)	Format :	Échelle / Scale:	Page #:
X.XX ± 0.010"	G. Lapointe	2006-04-24	A	1:1	1 de 1
X.XXX ± 0.005"	Vérifié par / Checked by:	Date: (yyyy-mm-dd)	Numéro dessin / Drav	ving Number:	Rev.#:
ANGLE ± 1°			VNI	2084	R1
PROJECTION: 🕀 🗔	Approuvé par / Approved by:	Date: (yyyy-mm-dd)	Numéro de pièce / Pa	rt Number:	Rev.#:
HURCHUN: 4		1	314-00	02-15-A	



**TOLERANCES** 

Note: Raw material specification: Stainless steel 304 annealed Threaded rod 1/4-28 UNF



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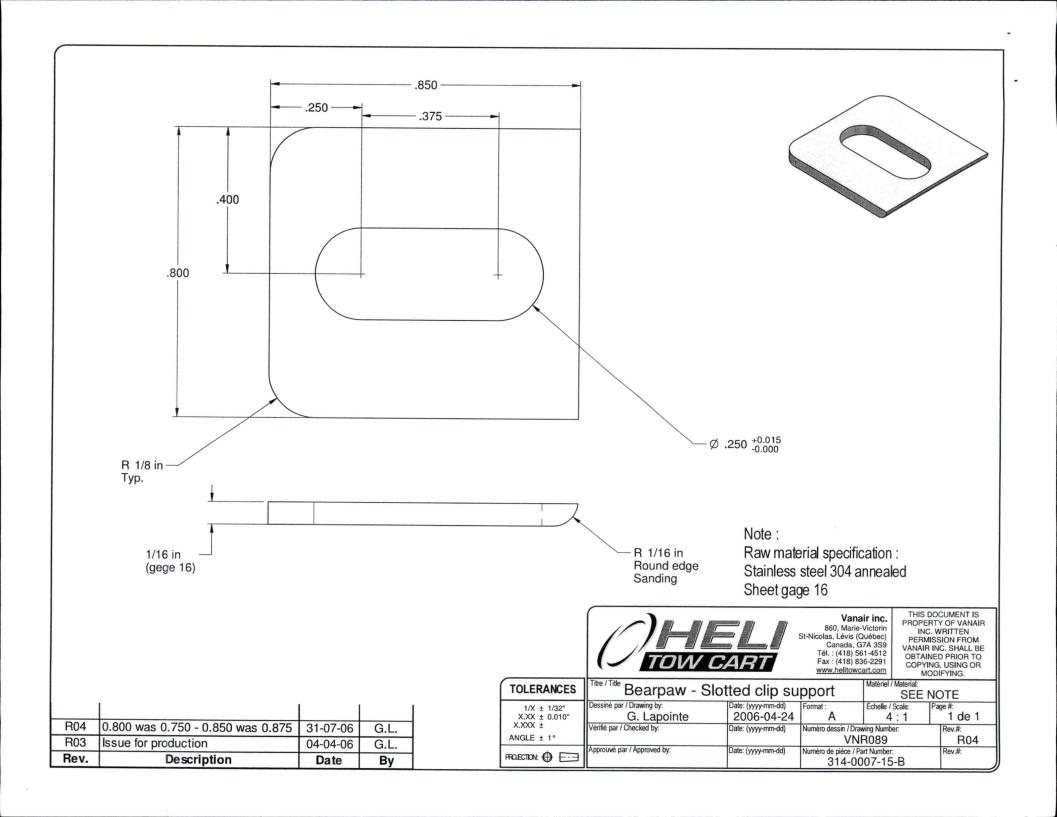
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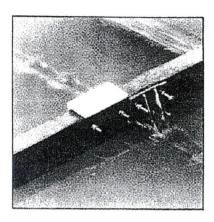
F	PROJECTION	: (	<b>+</b> F	3
1	ANGLE	±	10	
1	X.XXX	±	0.005"	
1			0.010"	
1			1/32"	

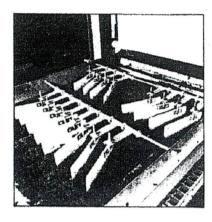
	Titre / Title Bearpaw - Icek	olade threa	ded rod	Matériel / Material: See	Note
I	Dessine par / Drawing by:	Date: (yyyy-mm-dd)	Format :	Échelle / Scale:	Page #:
I	G. Lapointe	2006-04-24	Α	N/A	1 de 1
١	Vérifié par / Checked by:	Date: (yyyy-mm-dd)	Numéro dessin / Draw	ving Number:	Rev.#:
l			VNF	R085	R1
ı	Approuvé par / Approved by:	Date: (yyyy-mm-dd)	Numéro de pièce / Pa	rt Number:	Rev.#:
١			314-00	04-15-A	

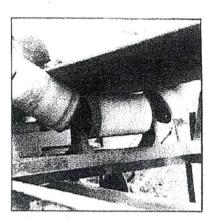
R1	Initial issue	03-08-06	G.L.
Rev.	Description	Date	Ву



### Propriétés du UHMW TIVAR®







TIVAR flight wear shoes do not corrode, and outwear shoes made from metals, urothanes and other plestics.

TIVAR is used in many OEM applica-tions to solve abrasion and corrosion problems. The scrapers on this belt press are of TIVAR.

Conveyor rollers lined with TIVAR reduce belt wear. Wet sludge doesn't build up as on conventional rollers.

PHYSICAL PROPERTIES
TEST METHOD
ASTM D-792
ASTM D-638
ASTM D-638
ASTM D-638
Stress Strain Diagram
Stress Strain Diagram
Stress Strain Diagram
ASTM D-785
ASTM D-2240
Bend Creep(1 min. value PROPERTY UNIT TYPICAL VALUE Specific Gravity
Yield Strength
Ultimate Tensile Strength
Break Elongation g/cm³ p.s.i. p.s.i. % 0.94 3400 6800 450 700 @73°F @73°F @250°F @250°F @250°F Break Elongation Ø'
Yield Strength Ø'
Ultimate Tensile Strength Ø'
Break Elongation Ø'
Hardness — Rockweil ''R'' Scale
Shore ''D'' Scale
Flexural Modulus of elasticity p.s.l. % 3300 900 900 64 67 110,000 9500 No Break No Break ASTM D-2240
Bend Creep/1 min. value
ASTM D-732
ASTM D-256A
ASTM D-256A
ASTM D-1693 Mod
ASTM D-570 p.s.i. p.s.i. ft-lbs/in. notch Fiextral Modulus of elasticity
Shear Strength
Izod Impact + @23°c
- @140°c
Environmental Stress Cracking @F<sub>50</sub>
Water Absorption It-lbs/in. notch

COEFFICIENT OF FRICTION

UHMW Polymer has a lower coefficient of friction than glass. Together with its self-lubricating characteristics it is an ideal material for bearings, bushings, valves, wear strips or any application where sliding contact is encountered.

bostimige, relives, wear strips of arry	application where stiding	contact is encountered.	
MATERIALS	STATIC	KINETIC	TEST METHOD
Mild Steel vs. Mild Steel	0.30-0.40	0.25-0.35	TEST METHOD
Mild Steel vs. TIVAR-100	0.15-0.20	0.12-0.20	ASTM D-1894
TIVAR-100 vs. TIVAR-100	0.20-0.30	0.20-0.30	TOTAL DIAGRA

	DEFORMAT	ION UNDE	R COMPRE	SSION - %			PERMANENT	DEFORMATION
TEMP°F	PSI	INITIAL LOADING				AFTER REMOVAL OF LOAD		
I EIMB A	COMPRESSION	10 MIN.	100 MIN.	1000 MIN.	1 DAY	56 DAYS	AFTER 1 MIN.	AFTER 24 HRS.
68°	282 570 850 1140 1420	1.5 2.4 3.0 4.0 5.0	1.7 2.5 4.0 5.0 6.5	1.8 2.7 4.5 6.0 7.5	1.9 3.0 5.0 7.0 8.0	2.4 4.0 5.1 7.5 9.0	0,9 1.8 2.7 3.6 4.5	0.8 1.2 1.8 2.4 2.9

#### CHEMICAL RESISTANCE

Hydrochloric acid (conc.) - no appreciable reaction up to 80°C

Nitric acid (20%) - less than 20% decrease in yield stress and ultimate tensile strength up to 80°C.

sulphuric acid (50%) - no appreciable reaction up to 80°C. Less than 20% decrease in properties at 75% incentration,

Sodium hydroxide (caustic soda) - no appreciable reaction up to 80°C.

Sodium hypochlorate and most aqueous solutions of inorganic salts - no appreciable reaction up to 80°C.

Hydrocarbons and halogenated hydrocarbons -limited resistance. Each application should be evaluated.

#### www.plastiquepolyfab.com

QUÉBEC: 1275, de la Jonquière, Québec, QC, Tél.: 418-682-0760 ou 1-866-682-0760

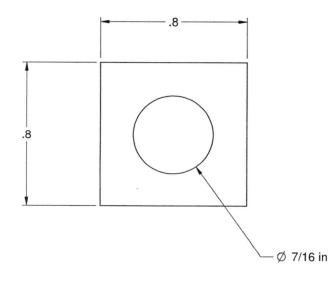
MONTRÉAL: 7600, Rte Transcanadienne, St-Laurent, QC, H4T 1A5 Tél.: 514-738-6817 ou 1-888-506-9600

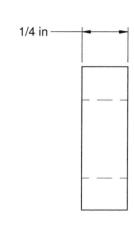
# Ultra High Molecular Weight Polyethylene

### UHMWPE Typical Properties

Specific Gravity, 73°F	.944	
Tensile Strength @ Yield, 73°F	3250	psi
Tensile Modulus of Elasticity, 73°F	155,900	psi
Tensile Elongation (at break), 73°F	330	%
Flexural Modulus of Elasticity	107,900	psi
Compresive Strength at 2% deformation	400	psi
Compressive Strength 10% Deformation	1200	psi
Deformation Under Load	6-8	%
Compressive Modulus of Elasticity, 73°F	69,650	psi
Hardness, Durometer (Shore "D" scale)	69	
Izod Impact, Notched @ 73°F	30	ft.lbs./in. of notch
Coefficient of Friction (Dry vs Steel) Static	.17	
Coefficient of Friction (Dry vs Steel) Dynamic	.14	
Sand Wheel Wear/Abrasion Test	95	UHMW=100
Coefficient of Linear Thermal Expansion	11.0	in/in/°F x 10 <sup>-5</sup>
Melting Point (Crystaline Peak)	279-289	°F
Volume Resistivity	>10 <sup>15</sup>	ohm-cm
Surface Resistivity	>10 <sup>15</sup>	ohm-cm
Water Absorption, Immersion 24 Hours	Nil	%
Water Absorption, Immersion Saturation	Nil	%
Machinability Rating	5	1 = easy. 10 = difficult
Sheet Thickness Availability (Off the Shelf)	.250 - 2.0	inches









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TOLERANCES

1/X ± 1/32"

X.XX ± 0.010"

X.XXX ± 0.005"

ANGLE ± 1°

PROJECTION: 🕀 🖂

Titre / Title Bearpaw - Fille	Matériel /	Material: UHN	1W		
Dessiné par / Drawing by: G. Lapointe	Date: (yyyy-mm-dd) 2006-08-08	Format :	Échelle /	Scale:	<sup>2</sup> age #: 1 de 1
Vérifié par / Checked by:	Date: (yyyy-mm-dd)	Numéro dessin / Drav	ving Numb	ег.	Rev.#: R01
Approuvé par / Approved by:	Date: (yyyy-mm-dd)	Numéro de pièce / Pa 314-00			Rev.#.

R01	Initial issue	08-08-06	G.L.
Rev.	Description	Date	Ву

# FIT Preferred Heat Shrink Products GENERAL PURPOSE, IRRADIATED POLYOLEFIN

									Standa	ırd Pack	ages	
Alpha Part No. And Size		mum ied I.D. mm	Maxi Recover Inches		Nom. Red Wall Thi Inches		4 Ft. Lengths Total Ftg.	Tot. Ftg.	Spools Tot. Ftg.	Tot. Ftg.	No. Cut Pieces 6 Inch	No. Cut Pieces 1/2" or 1"
FIT-221-3/64	0.046	1,17	0.023	0,58	0.016	0,41	100	1000			40	1000
<b>FIT</b> -221-1/16	0.063	1,60	0.031	0,78	0.017	0,43	100	1000	100	70	36	1000
<b>FIT</b> -221-3/32	0.093	2,36	0.046	1,17	0.020	0,50	100	500	100	65	32	1000
FIT-221-1/8	0.125	3,18	0.062	1,58	0.020	0,50	100	500	100	60	28	1000
FIT-221-3/16	0.187	4,75	0.093	2,36	0.020	0,50	100	500	100	50	24	1000
FIT-221-1/4	0.250	6,35	0.125	3,18	0.025	0.63	100	250	100	40	20	1000
FIT-221-3/8	0.375	9,53	0.187	4,75	0.025	0,63	100	200	50	35	16	1000
FIT-221-1/2	0.500	12,70	0.250	6,35	0.025	0,63	20	150	50	32	14	_
FIT-221-3/4	0.750	19,10	0.375	9,53	0.030	0.76	20	250	50	24	12	_
FIT-221-1	1.000	25,40	0.500	12,70	0.035	0,88	20	250	50	16	8	_
FIT-221-1-1/2	1.500	38,10	0.750	19,10	0.040	1,02	20	125	_	-	5	_
FIT-221-2	2.000	50,80	1.000	25,40	0.045	1,16	20	125	_	_	3	_
FIT-221-3	3.000	76,20	1.500	38,10	0.050	1,27	8	100	_	_	2	_
FIT-221-4	4.000	101,60	2.000	50,80	0.055	1,40	8	50	_	-	ī	-

#### **SPOOL COLOR AVAILABILITY CHART**

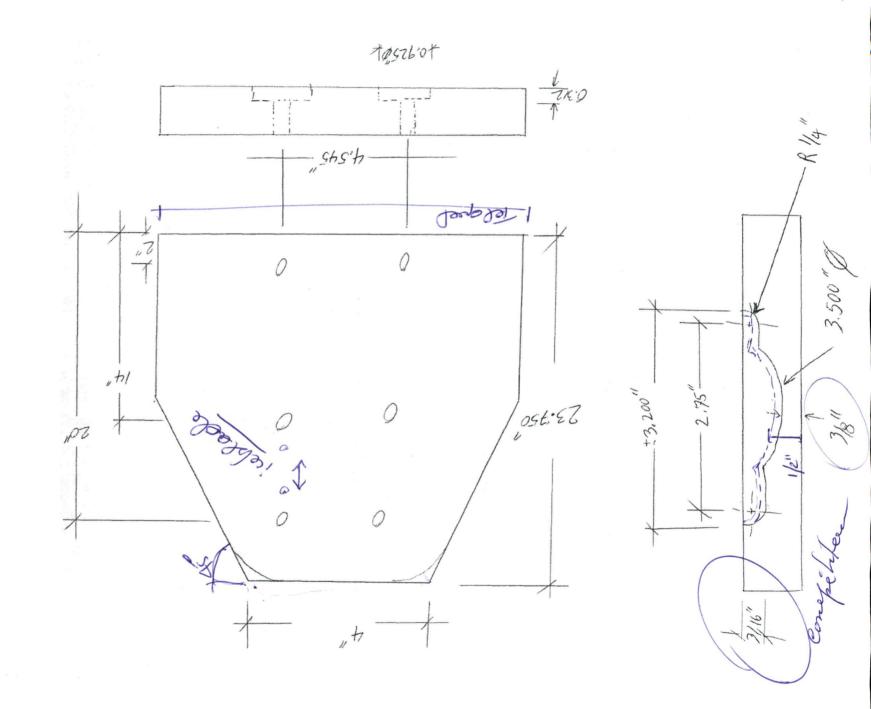
FIT-221 Tubing Size	Put-Up	Colors
3/64"	1000'	Black, Clear
1/16"	1000' 100'	All Colors* Black, Clear
3/32"	70' 500' 100' 65'	All Colors All Colors Black, Clear All Colors
1/8"	500' 100' 60'	All Colors Black, Clear All Colors
3/16"	500' 100' 50'	All Colors Black, Clear All Colors
1/4"	250' 100' 40'	All Colors Black, Clear All Colors

FIT-221 Tubing Size	Put-Up	Colors
3/8"	200' 50' 35'	All Colors Black, Clear All Colors
3/4"	150' 50' 32' 250' 50'	All Colors Black, Clear All Colors All Colors Black, Clear
"ן	24" 250" 50" 16"	All Colors All Colors Black, Clear All Colors
1-1/2"	125'	Black, Clear
2"	125'	Black, Clear
3"	100'	Black, Clear
4"	50'	Black, Clear

<sup>\*</sup>All colors include black, white, clear, red, yellow, blue, green







#### Mandat de dessin 2010 11 09

De : Nathalie Barbeau, Helitowcart À : Christian Beaulieu, CNC tech

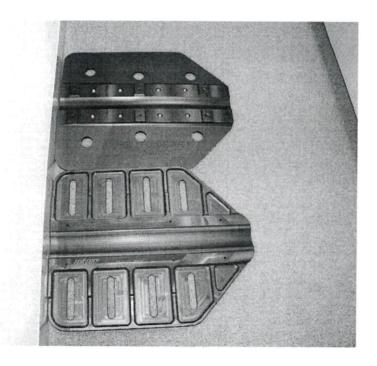
Objet: Réaliser dessin de production pour un pad en UHMW.

#### Paramètres de réalisation :

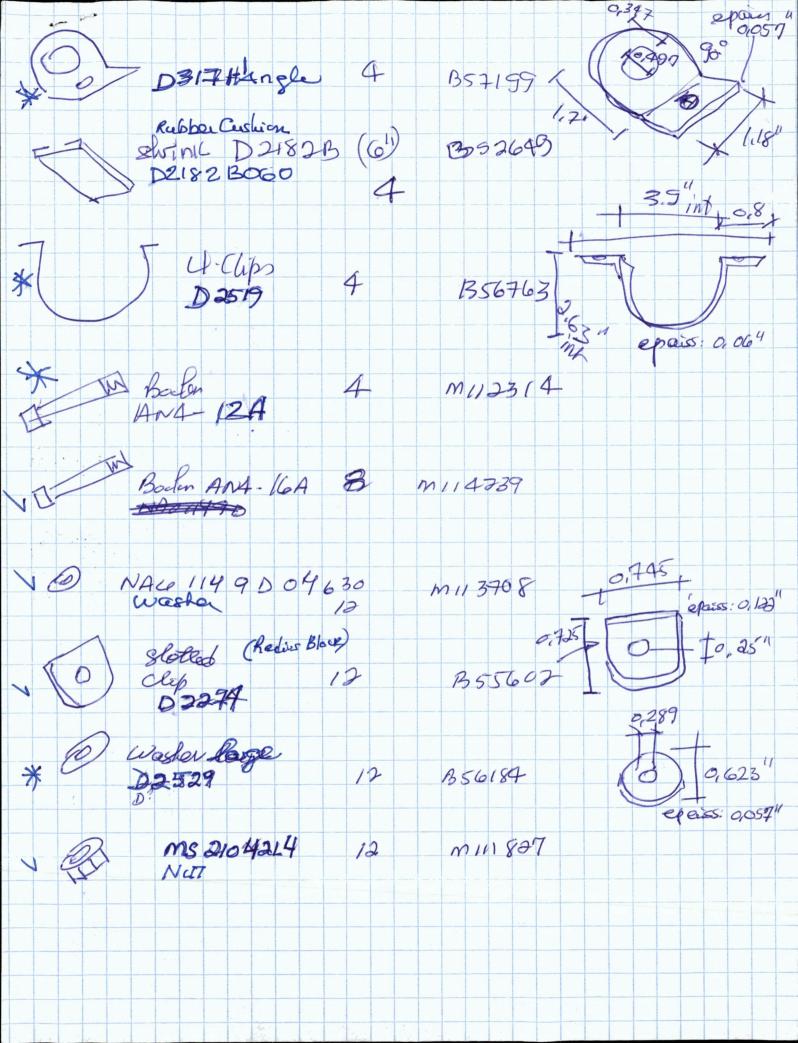
Partir du dessin du pad de BP350 actuel de Helitowcart. (voir dessin "VNR106-S (padBP350 2010 11 09)" qui t'a été transmis par courriel aujourd'hui.)

Créer un nouveau dessin appelé VNR106-S-130. P/N 314-0024-01 rev A

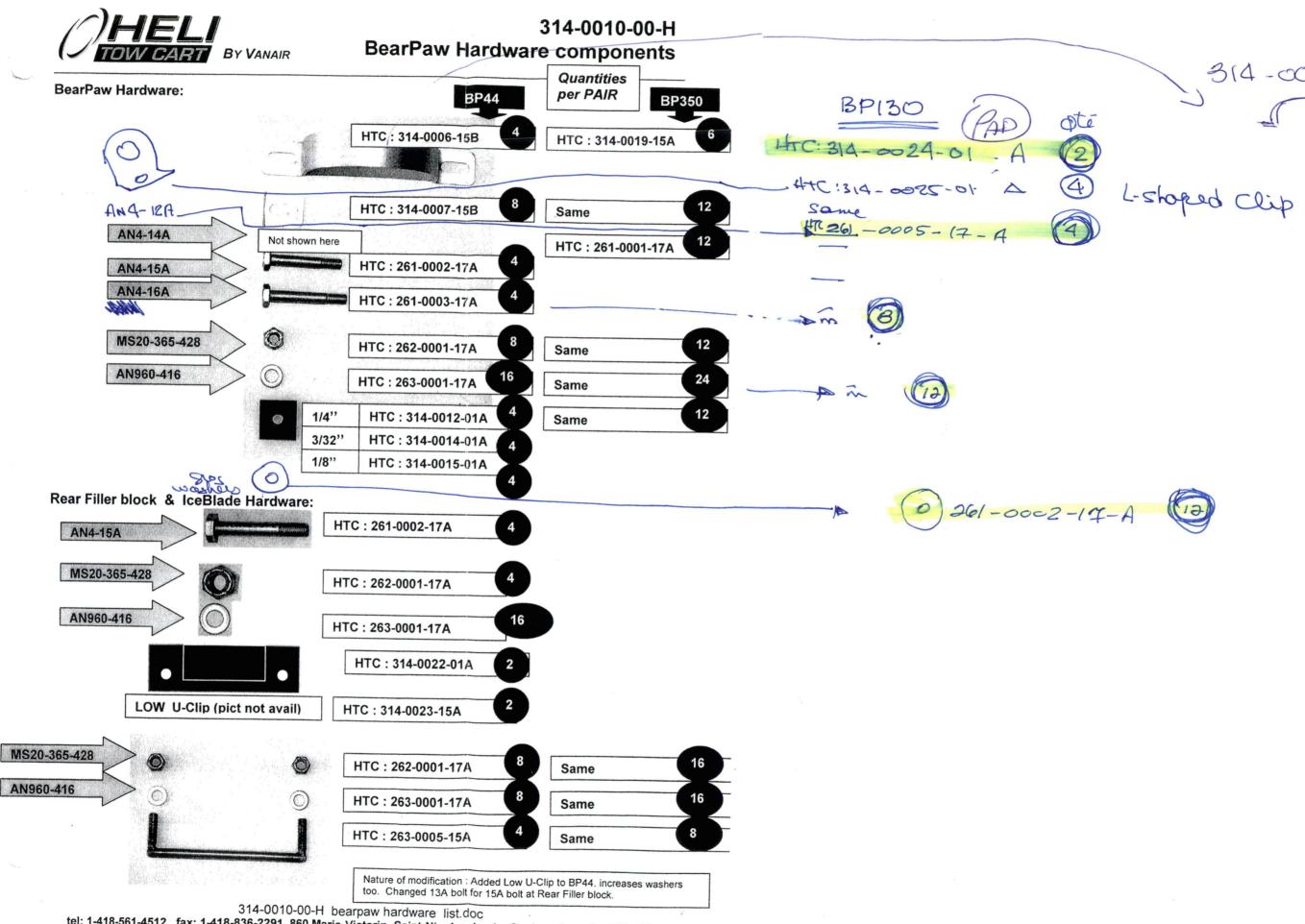
- 1) Ajuster la longueur pour rencontrer celle du modèle. S'assurer de faire le même angle au bout pointu (pour éviter que l'on accroche les roues) donc, couper dans la zone pointue.
- 2) Positionner les trous de fixation aux mêmes endroits que le bearpaw du modèle. Ajuster les positions de nos trous de Iceblade en conséquence (on peut avancer ou reculer).
- 3) Ajuster le rayon d'encavure de skid sur notre pad pour être de la même forme que celui du modèle.
- 4) Indiquer le P/N 314-0024-01 gravé sur le pad (en remplacement du no existant).



<sup>\*\*\*</sup>Requis mercredi le 10 nov à 16H00. (On doit retourner le modèle avant fin de la journée demain).



314-0026-15 A



tel: 1-418-561-4512, fax: 1-418-836-2291, 860 Marie-Victorin, Saint-Nicolas, Levis, Quebec, Canada G7A 3S9.

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n . . . . . 1

### DART AEROSPACE LTD.

ICA-D130-700 ICA Page 23 (24 blank) of 24

### 32.3 WEIGHT AND BALANCE

Installation		LA	TERAL	LONG	ITUDINAL
	Weight	Arm	Moment	Arm	Moment
D130-700-011 Bearpaw Installation	12.5 lb	0.0 in	0.0 lb-kg	159.8 in	1998 in-lb
	5.67 kg	0.0 m	0.0 m-kg	4.05 m	23.0 m-kg

### 32.4 PARTS LIST

Qty Part Number	Description
-----------------	-------------



DART AEROSPACE LTD. 1270 Aberdeen Street Hawkesbury, ON, K6A 1K7 CANADA

Tel: 1 613 632 3336 Fax: 1 613 632 4443

e-mail: heli@dartaero.com http://www.dartaero.com

## INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

ICA-D130-700

# Bearpaw Installation

EC130 B4 MODELS

CANADA DEPARTMENT OF TRANSPORT AIRCRAFT CERTIFICATION BRANCH DEC 1 8 2002 NAPA NO \_ 0 - 01-CERT/ISSUE NO. 5H 93-4 issue 6

K. Johnston

**Engineering Clerk** 

Shepherd, P. Eng.

DE #02

Released By:

Shepherd, P. Eng.

DE #02

ICA Page 3 (4 blank) of 24

#### **REVISION RECORD**

Revision No.	Issue Date	Description	Date Inserted	Inserted By
0	02.10.08	New Issue		

TC Accepted

DEC 1 8 2002

#### **LIST OF EFFECTIVE PAGES**

DESCRIPTION	PAGE(S)	REVISION
COVER	1, 2 BLANK	0
REVISION RECORD	3, 4 BLANK	0
LIST OF EFFECTIVE PAGES	5, 6 BLANK	0
TABLE OF CONTENTS	7, 8 BLANK	0
CHAPTER 0 - INTRODUCTION	9,10 BLANK	0
CHAPTER 0 - INTRODUCTION	11,12 BLANK	0
CHAPTER 4 – AIRWORTHINESS LIMITATIONS	13,14 BLANK	0
CHAPTER 5 - INSPECTION REQUIREMENTS	15,16 BLANK	0
CHAPTER 32 -LANDING GEAR	17,18 BLANK	0
CHAPTER 32 -LANDING GEAR	19,20 BLANK	0
CHAPTER 32 –LANDING GEAR	21,22 BLANK	0
CHAPTER 32 -LANDING GEAR	23,24 BLANK	0

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APPENDIX A: APPROVALS

TC Accepted DEC 1 8 2002

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DFC 1 8 2002

### CHAPTER 0 - INTRODUCTION (00-00-00)

#### 0.1 SCOPE

This manual provides the requirements set forth in Appendix A of FAR Part 27 for the Instructions for continued Airworthiness of the Dart D130-700-011 bearpaws when installed on the EC130 B4 model aircraft. These Instructions for Continued Airworthiness are to be referred to for inspection and maintenance when the Dart bearpaws are installed on, removed from, or in service on the rotorcraft.

#### 0.2 **ARRANGEMENT**

The manual is arranged in ATA-100 format. This manual is only applicable to EC130 B4 model rotorcraft modified with the Dart D130-700-011 bearpaws.

There are no abbreviations, acronyms, or symbolization which are not common to the aviation industry in this manual.

Units of measurement are expressed in Imperial and metric values and all torque values are standard values for the specified fastener combinations as defined in FAA AC 43.13, unless otherwise specified in this document.

No other Instructions for Continued Airworthiness for any product or appliance is inferred or addressed herein.

#### 0.3 DISTRIBUTION

Any changes in the content or revision level of this document will be made available to any owner/operator who possesses this STC when requested in writing. Requests should be made to:

> Dart Aerospace Ltd. 1270 Aberdeen Street Hawkesbury, ON K6A 1K7 CANADA

Fax. (613) 632 4443 Email: heli@dartaero.com

Additionally, any changes will be sent to Transport Canada. All changes will be recorded in the Record of Revisions page at the front of this manual.

#### COMPATIBILITY 0.4

Compatibility of this installation with the aircraft is the responsibility of the installer. Ensure that this installation does not conflict with a previous modification.

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#### 0.5 SYSTEM DESCRIPTION

The Dart D130-700-011 Bearpaws mount to the aft end of the EC130 B4 skidtubes and are intended to provide better stability when the rotorcraft lands in soft terrain. One Bearpaw is installed on each skidtube and is attached with clamps and standard hardware.

The components in the Dart Bearpaw Installation are as defined in the table in section 32.4 of this document.

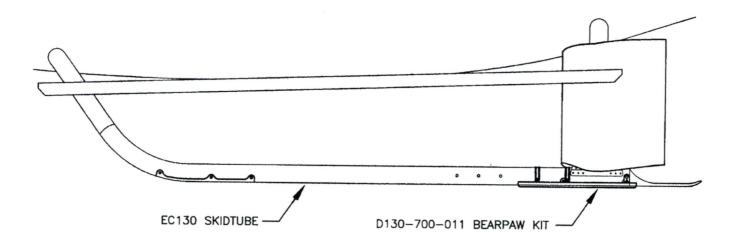


Figure 0-1: EC130 Bearpaw Installation

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00-00-00

### CHAPTER 4 - AIRWORTHINESS LIMITATIONS (04-00-00)

No airworthiness limitations associated with this type design change.

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ICA Page 15 (16 blank) of 24

#### CHAPTER 5 - INSPECTION REQUIREMENTS (05-00-00)

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#### 5.1 300 HOUR INSPECTION

(To coincide with landing gear inspection or if damage found on daily inspection)

Note: For the convenience of scheduling maintenance, the tolerance for scheduled inspection intervals is +/-10% (+/- 30 hours). In each case, the subsequent interval will be adjusted to re-establish the original schedule. When an inspection is done more than 10% early, subsequent inspections will be advanced as required not to exceed the maximum tolerance.

- 1. Remove the bearpaws per chapter 32 of these instructions and inspect the bearpaws and clamps for damage and/or wear.
- 2. In the shaded region of Figure 5-2, the bearpaw may be worn by a maximum of 0.125" (3.18mm) down to the minimum allowable values specified in Table 5-1. Outside the shaded region of Figure 5-2, (ie. in the pockets) it is acceptable to have worn areas up to a maximum of 0.125" (3.18mm) deep over a maximum area of 2 sq. in (1290 sq. mm). The edge of one damaged region must be a minimum of 2" (51mm) away from the edge of next nearest damaged region.

Table 5-1: Bearpaw Damage Limits

Dimension	Nominal	Max. Allowable	Min. Allowable
	Thickness	Wear	Dimension
Α	0.375 in	0.125 in	0.250 in
	9.53 mm	3.18 mm	6.35 mm
В	0.750 in	0.125 in	0.625 in
	19.05 mm	3.18 mm	15.88 mm
С	0.950 in	0.125 in	0.825 in
	24.13 mm	3.18 mm	20.96 mm

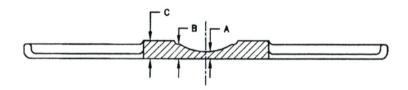


Figure 5-2: Damage Limit Diagram

- 3. Cracks are acceptable in the unshaded portion of Figure 5-2 as long as they are restricted to the pockets of the bearpaws. Cracks that penetrate the stiffening ribs of the unshaded regions are unacceptable. Stop drill all cracks up to 0.50" (12.7mm) long with Ø0.188" (Ø4.78mm) drill.
- Report all damage in excess of indicated limits to Dart Aerospace Ltd. for evaluation and disposition.
- 5. Replace damaged or worn parts per chapter 32 of these instructions.
- 6. The bearpaws should be re-installed per chapter 32 of these instructions.

#### 5.2 OVERHAUL REQUIREMENTS

NO COMPONENT OVERHAUL REQUIRED FOR THIS DESIGN CHANGE.

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#### CHAPTER 32 - LANDING GEAR (32-00-00)

#### 32.1 BEARPAW INSTALLATION

To install the Dart Bearpaws on the EC130 B4 landing gear:

- Jack up the aircraft. Ensure the skidtubes are serviceable. Remove 22201BC060090L screw and ASN52320BH120N nut used to install aft wearplate on both skidtubes. Retain for Bearpaw installation.
- Install D3171-1 angles per Figure 32-3 using 22201BC060090L screw and ASN52320BH120N nut. Do not use 23111AG060LE washer.
- Position D3167-1 Bearpaw on the aft end of each skidtube so that the aft set of holes in the bearpaw line up with the holes in the D3171-1 angles as shown in Figure 32-1. Install AN4-12A bolts as shown in Figure 32-3. CAUTION: The torque on the nuts should be limited to 20 in-lb (2.3 Nm).
- Install the D2519 clamps with the hardware as shown in Figure 32-2. CAUTION: The torque on the nuts should be limited to 20 in-lb (2.3 Nm).
- The D3167-1 Bearpaw may be relieved to clear wearshoe mounting screws provided the relief 5. leaves 0.375" (9.53mm) thickness.
- Additional AN960JD416 washers may be installed under the nuts to ensure 1.5-4 threads in safety on the bolts. Although not generally necessary, it is also acceptable to replace the AN4 bolts provided with longer or shorter AN4 bolts, if required.
- 7. Lower the aircraft.

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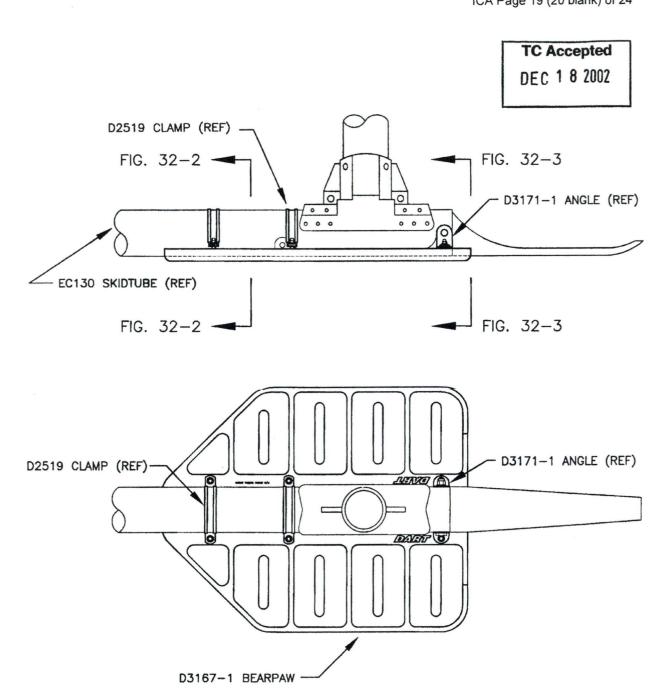


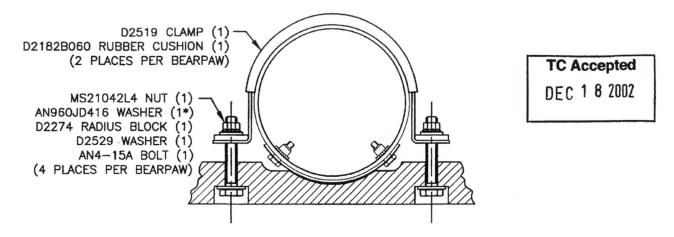
Figure 32-1: Bearpaw Installation (Side View & Top View)

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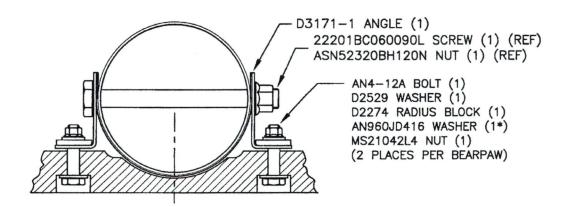
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32-00-00

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\* See note 6
Figure 32-2: Clamping Detail (Forward Clamps)



\* See note 6
Figure 32-3: Clamping Detail (Aft Clamps)

#### 32.2 BEARPAW REMOVAL

- 1. Jack up the aircraft.
- Loosen the clamp bolts and remove the bearpaws, clamps and angles. Ensure the skidtubes are serviceable.
- If permanently removing the bearpaws, ensure 22201BC060090L screw, 23111AG060LE washer, and ASN52320BH120N nut are properly installed through the blade fittings at the back of the skidtubes.
- Lower the aircraft.

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32-00-00

#### 32.3 WEIGHT AND BALANCE

		LATERAL		LONGITUDINAL	
Installation	Weight	Arm	Moment	Arm	Moment
D130-700-011 Bearpaw Installation	12.5 lb	0.0 in	0.0 lb-kg	159.8 in	1998 in-lb
	5.67 kg	0.0 m	0.0 m-kg	4.05 m	23.0 m-kg

### 32.4 PARTS LIST

Qty	Part Number	Description	
Х	D130-700-011	BEARPAW INSTALLATION	
4	D2182B060	Rubber Cushion	
12	D2274	Radius Block	
12	D2529	Washer	
4	D2519	Clamp	
2	D3167-1	Bearpaw	
4	D3171-1	Angle	
4	AN4-12A	Bolt	
8	AN4-15A	Bolt	
12	AN960JD416	Washer	
12	MS21042L4	Nut (or MS21042-4)	

**TC Accepted** 

DEC 1 8 2002

# **APPENDIX A:**

# **APPROVALS**



#### Department of Transport

## Supplemental Type Certificate

This approval is issued to:

Number: SH93-4

Dart Aerospace Ltd.

Issue No.:

1270 Aberdeen Street

Hawkesbury, ONTARIO

March 30, 1993 Approval Date:

K6A 1K7 CANADA

Issue Date:

January 13, 2003

Responsible Region:

Ontario

Aircraft/Engine Type or Model:

Eurocopter France AS350 B, B1, B2, B3, BA, D, D1

Eurocopter France AS355, E, F, F1, F2

Eurocopter France EC 130 B4

Canadian Type Approval or Equivalent:

H-83, H-87

Description of Type Design Change:

Installation of Bearpaws

Installation/Operating Data,

Required Equipment and Limitations:

AS 350/355 models

Installation of Bearpaws is to be carried out in accordance with Dart Aerospace Ltd. Drawing No. D350-578, Rev E, dated 02.10.18, or later Transport Canada approved revision.

Inspection of the installation is to be performed in accordance with Dart Aerospace Ltd. Instructions for Continued Airworthiness ICA-D350-578, rev 0, dated 02.10.18, or later Transport Canada accepted revision.

#### EC 130 B4 model

Installation of Bearpaws is to be carried out in accordance with Dart Aerospace Ltd. Drawing No. IIN-D130-700, Rev A, dated 02.10.08, or later Transport Canada approved revision.

Inspection of the installation is to be performed in accordance with Dart Aerospace Ltd. Instructions for Continued Airworthiness ICA-D130-700, rev 0, dated 02.10.08, or later Transport Canada accepted revision.

- END -

Conditions: This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated will not adversely affect the airworthiness of the modified product.

Senior Engineer, Aircraft Certification

For Minister of Transport





#### United States of America

### Department of Transportation -- Federal Abiation Administration

# Supplemental Type Certificate

IMPORT

Number SR00028NY

This certificate issued to

Dart Aerospace Ltd. 1270 Aberdeen Street Hawksbury, Ontario, CN K6A 1K7

certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the aircorthiness requirements of Part 27/21.29 of the Federal Aviation Regulations.

Original Product -- Type Certificate Number:

Make:

Model: \*

\*See attached FAA Approved Model List (AML) No SR00028NY for list of approved aircraft models and applicable airworthiness regulations.

Description of Type Design Change:

The installation of Bearpaws in accordance with instructions lised in the AML.

#### Limitations and Conditions:

See attached AML for required documentation.

Compatibility of this design change with previously approved modifications must be determined by the installer.

If the holder agrees to permit another person to use the certificate to alter the product, the holder shall give the other person written evidence of that permission

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application: April 06, 1993

Date of issuance: August 17, 1993

Date reissued :

Date amended: June 26, 1996, March 24, 1999,

April 14, 2003

By direction of the Administrator

Vito A. Pulera

Manager

New York Aircraft Certification Office

(Title)

#### FAA APPROVED MODEL LIST (AML) No. SR00028NY

#### DART AEROSPACE LIMITED

#### **FOR**

#### **BEARPAWS INSTALLATION**

Issue Date: August 17, 1993

PART	REGULA- TION	MAKE	MODEL	ORIGINAL PRODUCT	REQU	AML AMEND-		
				TYPE CERTIFI- CATE DATA SHEET	INSTALLATION INSTRUCTIONS	INSTRUCTIONS FOR CONTINUED AIRWORTHINESS	ROTORCRAFT FLIGHT MANUAL SUPPLEMENT	MENT DATE
27	Federal Aviation	Eurocopter	AS350B, B1, B2, B3, BA, C, D, D1	H9EU	D350-578, Rev. E dated October 18, 2002 or later Transport Canada approved revision	ICA-D350-578, Rev. 0 dated October 18, 2002 or later Transport Canada accepted revision	FMS-D350- 578, Rev. A dated November 6, 1996 or later Transport Canada approved revision	April 14, 2003
27	Federal Aviation	Eurocopter	EC 130 B4	H9EU	IIN-D130-700, Rev. A dated October 8, 2002 or later Transport Canada approved revision	ICA-D130-700, Rev. 0 dated October 8, 2002 or later Transport Canada accepted revision		April 14, 2003

FAA Approved:\_

Vito A. Pulera

Manager, New York Aircraft Certification Office



### SUPPLEMENTAL TYPE CERTIFICATE

#### EASA.IM.R.S.01389

This certificate, established in accordance with Regulations (EC) No 1592/2002 and (EC) No 1702/2003 and issued to:

Dart Aerospace Ltd. 1270 Aberdeen Street K6A 1K7 Hawkesbury ON Canada

certifies that the change in the type design for the product listed below with the limitations and conditions specified meets the applicable type certification basis and environmental protection requirements when operated within the conditions and limitations specified below:

Original Product Type Certificate number: EASA TCDS EASA.R.146

Manufacturer: Eurocopter

Model: Eurocopter France AS 350 B, AS 350 B1, AS 350

B2, AS 350 B3, AS 350 BA, AS 350 D, AS 355E,

AS 355F, AS 355F2, EC 130 B4, AS 355F1

Original STC Number: TCCA STC SH93-4

Description of Design Change:

Installation of Bearpaws.



#### **Associated Technical Documentation:**

- AS 350 and AS 355:
  - Dart Aerospace drawing no. D350-578 Rev. E, dated 18-10-2002 or later Transport Canada (TCCA) approved revision.
  - Dart Aerospace Instructions for Continued Airworthiness ICA-D350-578, Rev. 0, dated 18-10-2002 or later TCCA approved revisions.
- EC130 B4:
  - Dart Aerospace drawing no. IIN-D130-700, Rev. A, dated 8-10-2002 or later Transport Canada (TCCA) approved revision.
  - Dart Aerospace Instructions for Continued Airworthiness ICA-D130-700, Rev. 0, dated 8-10-2002 or later TCCA approved revisions.

#### **Limitations and Conditions:**

Prior to installation of this modification the installer must determine that the interrelationship between this modification and any other previously installed modification will introduce no adverse effect upon the airworthiness of the product. The installation of this modification by third persons is subject to written permission of the approval holder.

This certificate shall remain valid unless otherwise surrendered or revoked.

For the European Aviation Safety Agency,

Date of Issue: 22 October 2007

Certification Manager
Rotorcraft, Balloons, Airships

Mircharley



#### DART AEROSPACE LTD. 1270 Aberdeen Street Hawkesbury, ON, K6A 1K7 CANADA

Tel: 16136323336 Fax: 1 613 632 4443

e-mail: heli@dartaero.com http://www.dartaero.com



### **TECHNICAL SUPPORT** OR **COMMENTS?**

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### **INSTALLATION INSTRUCTIONS**

IIN-D130-700

## Bearpaw

EC130 B4 MODELS

CANADA DEPARTMENT OF TRANSPORT AIRCRAFT CERTIFICATION **BRANCH** DAO # 01-O-01

**APPROVED** 

D. SHEPHERD (DE # 02)

DATE: CERT. NO .: OCT. 08, 2002 SH93-4

ISSUE NO .:

K. Johnston

**Engineering Clerk** 

D. Shepherd, P.Eng.

Released By:

DE #02

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Revision: A

Date: 02.10.08

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IIN-D130-700 Page 2 of 6

#### **REVISION RECORD**

Revision	Issue Date	Description	
Α	02.10.08	New Issue	

#### 1. INTRODUCTION

The Dart D130-700-011 Bearpaws mount to the aft end of the EC130 B4 skidtubes. One Bearpaw is installed on each skidtube and is attached with clamps and standard hardware. The purpose of the bearpaw installation is to provide better stability on soft ground.

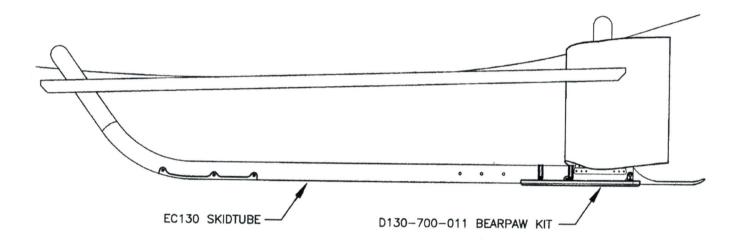


Figure 1 – EC130 Bearpaw Installation

#### 2. GENERAL NOTES

#### COMPATIBILITY

Compatibility of this installation with the aircraft is the responsibility of the installer. Ensure that this installation does not conflict with a previous modification.

#### CONTINUING AIRWORTHINESS

This installation should be maintained in accordance with the Instructions for Continued Airworthiness ICA-D130-700.

#### 3. INSTALLATION PROCEDURE

To install the Dart Bearpaws on the EC130 B4 landing gear:

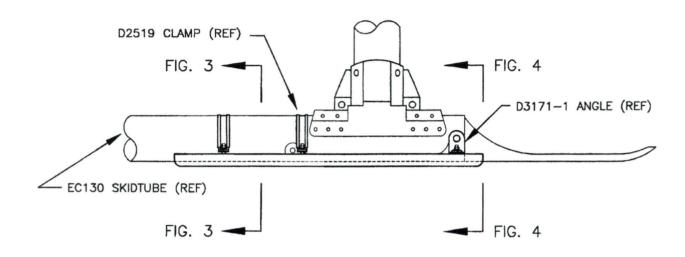
- Jack up the aircraft. Ensure the skidtubes are serviceable. Remove 22201BC060090L screw and ASN52320BH120N nut used to install aft wearplate on both skidtubes. Retain for Bearpaw installation
- Install D3171-1 angles per Figure 4 using 22201BC060090L screw and ASN52320BH120N nut. 2. Do not use 23111AG060LE washer
- Position D3167-1 Bearpaw on the aft end of each skidtube so that the aft set of holes in the 3. bearpaw line up with the holes in the D3171-1 angles as shown in Figure 2. Install AN4-12A bolts as shown in Figure 4.

CAUTION: The torque on the nuts should be limited to 20 in-lb (2.3 Nm).

- Install the D2519 clamps with the hardware as shown in Figure 3. CAUTION: The torque on the nuts should be limited to 20 in-lb (2.3 Nm).
- The D3167-1 Bearpaw may be relieved to clear wearshoe mounting screws provided the relief 5 leaves 0.375" (9.53mm) thickness.
- Additional AN960JD416 washers may be installed under the nuts to ensure 1.5-4 threads in safety on the bolts. Although not generally necessary, it is also acceptable to replace the AN4 bolts provided with longer or shorter AN4 bolts, if required.
- 7. Lower the aircraft.

#### 4. WEIGHT AND BALANCE

		LATERAL		LONGITUDINAL	
Installation	Weight	Arm	Moment	Arm	Moment
D130-700-011 Bearpaw Installation	12.5 lb	0.0 in	0.0 lb-kg	159.8 in	1998 in-lb
	5.67 kg	0.0 m	0.0 m-kg	4.05 m	23.0 m-kg



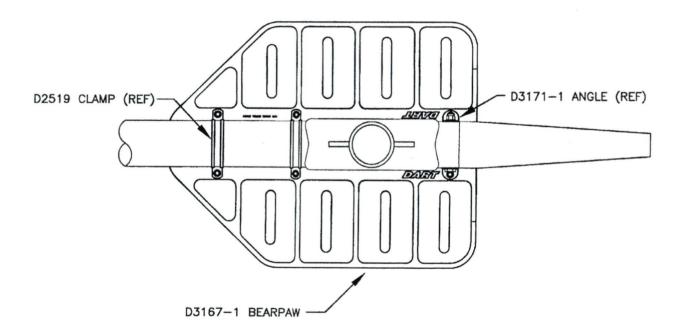


Figure 2 – Bearpaw Location (SIDE VIEW & TOP VIEW)

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Revision: A Date: 02.10.08

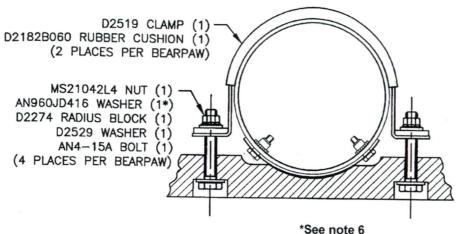
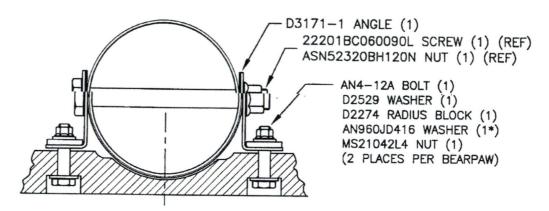


Figure 3 - Clamping Detail (Forward Clamps)



\*See note 6 Figure 4 - Clamping Detail (Aft Clamps)

#### 5. PARTS LIST

Qty	Part Number	Description
Х	D130-700-011	BEARPAW INSTALLATION
4	D2182B060	Rubber Cushion
12	D2274	Radius Block
12	D2529	Washer
4	D2519	Clamp
2	D3167-1	Bearpaw
4	D3171-1	Angle
4	AN4-12A	Bolt
8	AN4-15A	Bolt
12	AN960JD416	Washer
12	MS21042L4	Nut (or MS21042-4)

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Revision: A Date: 02.10.08

DART SERVICE INSTRUCTION
TO AMEND INSTALLATION INSTRUCTIONS IIN-D130-700 REV. A
AND INSTRUCTIONS FOR CONTINUED AIRWORTHINESS ICA-D130-700 REV. 0

REF. TCCA STC: SH93-4 REF. FAA STC: SR00028NY REF. EASA STC: EASA.IM.R.S.01389

The D130-700-021 Wearplate kit can be installed on D130-700-011 Bearpaw installations. The D3862-041 Wearplates should be installed on the D3167-1 Bearpaws as shown in Figure 1 on Sheet 2 of this Service Instruction. The Bearpaws should otherwise be installed on the skidtube per installation instructions IIN-D130-700 Rev A.

Customers with old style bearpaws will need to rework the counterbore on the bottom of the bearpaws per Figure 1 on Sheet 2 of this service instruction.

#### **WEIGHT AND BALANCE**

Installation	Weight	L.a	teral	Longitudinal	
		Arm	Moment	Arm	Moment
D130-700-021 Wearplate Kit	3.22 lb 1.46 kg	0.0 in 0.0 m	0.0 in-lb 0.0 m-kg	159.8 in 4.05 m	514.6 in-lb 5.91 m-kg

#### **PARTS LIST**

QTY. -021	PART NUMBER	DESCRIPTION	
Х	D130-700-021	Wearplate Kit	
2	D3862-041	Wearplate	
4	AN4-12A	Bolt	
8	AN4-15A	Bolt	
12	NAS1149D0463J	Washer	
12	MS21042L4	Nut or (MS21042-4)	

CANADA DEPARTMENT OF TRANSPORT AIRCRAFT CERTIFICATION **BRANCH** DAO # 01-O-01

D. SHEPHERD (DE # 02)

DATE CERT. NO .: ISSUE NO .:

SH93-4

Α	NEW IS	SUE	85	09.01.15			
REV.		DESCRIPTION			DATE		
DESIGN	DESIGN		DART AEROSPACE LTD				
DRAWN	٧	1	HAWKESBURY, ONTAR				
CHECKED		B	DRAWING NO.		REV. A		
MFG. APPR.		N/A	DSI 9434		SHEET 1 OF 2		
APPRO	VED	149	TITLE		SCALE		
DE APPR.			WEARPLATE KIT		NTS		
DATE 09.01.15			COPYRIGHT © 2009 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND COMFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR MY PURPOSE OR COMMUNICATED TO MY OTHER PERSON WITHOUT				



### SUPPLEMENTAL TYPE CERTIFICATE 10016984, REV. 1

This Supplemental Type Certificate is issued by EASA, acting in accordance with Regulation (EC) No. 216/2008 on behalf of the European Community, its Member States and of the European third countries that participate in the activities of EASA under Article 66 of that Regulation and in accordance with Commission Regulation (EC) No. 1702/2003 to

DART AEROSPACE LTD 1270 ABERDEEN STREET ONTARIO K6A 1K7 CANADA

and certifies that the change in the type design for the product listed below with the limitations and conditions specified meets the applicable Type Certification Basis and environmental protection requirements when operated within the conditions and limitations specified below:

Original Product TC Number:

SEE EASA APPROVED MODEL LIST

TC Holder:

EUROCOPTER

Model:

SEE EASA APPROVED MODEL LIST

Original STC Number:

TCCA STC SH93-4

#### **EASA Certification Basis:**

The Certification Basis for the original product remains applicable to this certificate/ approval. The requirements for environmental protection and the associated certificated noise and/ or emissions levels of the original product are unchanged and remain applicable to this certificate/ approval.

Description of Design Change:

Bearpaw Installation

See Continuation Sheet(s)

For the European Aviation Safety Agency,

Date of issue: 22.09.2010

Massimo MAZZOLETTI Certification Manager Rotorcraft, Balloons, Airships

Note:

The following numbers are listed on the certificate; EASA old Project Number: EASA.IM.R.S.01389, REV. 1

SUPPLEMENTAL TYPE CERTIFICATE - 10016984, REV. 1 - DART AEROSPACE LTD



#### **Associated Technical Documentation:**

AS 350 and AS 355 models:

MDL-D350-578 revision A dated 11 June 2010 - Master Document List;

D350-578 revision F dated 28 August 2008 - Installation Instructions;

ICA-D350-578 revision 1 dated 28 August 2008 - Instructions for Continued Airworthiness.

EC130B4 Model:

MDL-D130-700 revision A dated 11 June 2010 - Master Document List;

IIN-D130-700 revision A dated 8 October 2002 - Installation Instructions;

ICA-D130-700 revision 0 dated 8 October 2002 - Instructions for Continued Airworthiness or later revisions of the above listed documents approved by EASA in accordance with EASA ED Decision 2004/02/CF (or subsequent revisions of this decision)

#### Limitations:

none

#### Conditions:

Prior to installation of this modification it must be determined that the interrelationship between this modification and any other previously installed modification and/ or repair will introduce no adverse effect upon the airworthiness of the product.

This Certificate shall remain valid unless otherwise surrendered or revoked.

- end -

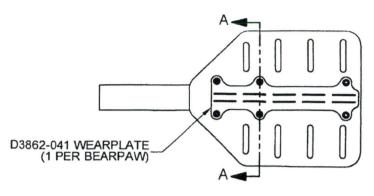
Note: The following numbers are listed on the certificate: EASA old Project Number: EASA.IM.R.S.01389, REV. 1

SUPPLEMENTAL TYPE CERTIFICATE - 10016984, REV. 1 - DART AEROSPACE LTD

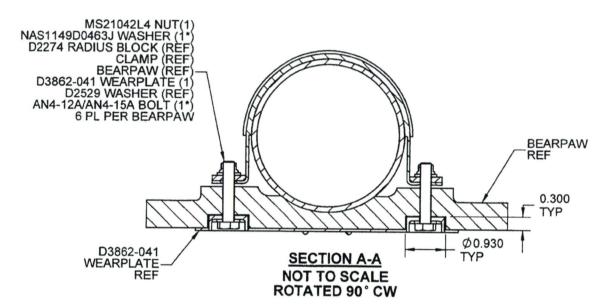


#### EASA Approved Model List (AML) 10016984, Rev.1 Dart Aerospace Ltd.

Date of Issue: 22nd September 2010 Rotorcraft Rotorcraft Model TC Make Eurocopter AS350B EASA.R.008 AS350B1 EASA.R.008 AS350B2 EASA.R.008 AS350B3 EASA.R.008 AS350BA EASA.R.008 AS350D EASA.R.008 EC130B4 EASA,R.008 AS355E EASA.R.146 AS355F EASA.R.146 AS355F1 EASA,R.146 AS355F2 EASA.R.146 AS355N EASA.R.146 AS355NP EASA.R.146



#### **BOTTOM VIEW**



\* ADDITIONAL NAS1149D0463J WASHERS MAY BE INSTALLED UNDER NUTS TO ENSURE 1.5 - 4 THREADS IN SAFETY ON BOLTS. ALTHOUGH NOT GENERALLY NECESSARY, IT IS ALSO ACCEPTABLE TO REPLACE THE AN4-12A/15A BOLTS WITH LONGER OR SHORTER AN4 BOLTS, IF REQUIRED.

#### FIGURE 1: D130-700-021 WEARPLATE KIT



DESIGN	35	DART AEROSPAC	FIID
DRAWN	35	HAWKESBURY, ONTARIO, 0	
CHECKED	B	DRAWING NO.	REV. A
MFG. APPR.	N/A	DSI 9434	SHEET 2 OF 2
APPROVED	149	TITLE	SCALE
DE APPR.	-	WEARPLATE KIT	NTS
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